Internal Assessment

Vignan's Institute of Management & Technology For Women
Kondapur (V), Ghatkesar (M), Medchal Malkajgiri (Dt.) Pin-501301 (T.S.)

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JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

(Established by State Act No. 30 of 2008)

Kukatpally, Hyderabad, Telangana (India).

ACADEMIC REGULATIONS FOR B.TECH. REGULAR STUDENTS WITH EFFECT FROM ACADEMIC YEAR 2018-19 (R-18)

1.0 Under-Graduate Degree Programme in Engineering & Technology (UGP in E&T)

Jawaharlal Nehru Technological University Hyderabad (JNTUH) offers a 4-year (8 semesters) **Bachelor of Technology** (B.Tech.) degree programme, under Choice Based Credit System (CBCS) at its non-autonomous constituent and affiliated colleges with effect from the academic year 2018-19.

2.0 Eligibility for admission

2.1 Admission to the under graduate (UG) programme shall be made either on the basis of the merit rank obtained by the qualified student in entrance test conducted by the Telangana State Government (EAMCET) or the University or on the basis of any other order of merit approved by the University, subject to reservations as prescribed by the government from time to time.

2.2 The medium of instructions for the entire under graduate programme in Engineering & Technology will be **English** only.

3.0 B.Tech. Programme structure

3.1 A student after securing admission shall complete the B.Tech. programme in a minimum period of **four** academic years (8 semesters), and a maximum period of **eight** academic years (16 semesters) starting from the date of commencement of first year first semester, failing which student shall forfeit seat in B.Tech course. Each student shall secure 160 credits (with CGPA $\geq$ 5) required for the completion of the under graduate programme and award of the B.Tech. degree.

3.2 **UGC/ AICTE** specified definitions/ descriptions are adopted appropriately for various terms and abbreviations used in these academic regulations/ norms, which are listed below.

3.2.1 Semester scheme

Each under graduate programme is of 4 academic years (8 semesters) with the academic year divided into two semesters of 22 weeks ($\geq$ 90 instructional days) each, each

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semester having - 'Continuous Internal Evaluation (CIE)' and 'Semester End Examination (SEE)' under Choice Based Credit System (CBCS) and Credit Based Semester System (CBSS) indicated by UGC, and curriculum/course structure as suggested by AICTE are followed.

3.2.2 Credit courses

All subjects/ courses are to be registered by the student in a semester to earn credits which shall be assigned to each subject/ course in an L: T: P: C (lecture periods: tutorial periods: practical periods: credits) structure based on the following general pattern.

- One credit for one hour/ week/ semester for theory/ lecture (L) courses or Tutorials.
- One credit for two hours/ week/ semester for laboratory/ practical (P) courses.

Courses like Environmental Science, Constitution of India, Intellectual Property Rights, and Gender Sensitization lab are mandatory courses. These courses will not carry any credits.

3.2.3 Subject Course Classification

All subjects/ courses offered for the under graduate programme in E&T (B.Tech. degree programmes) are broadly classified as follows. The University has followed almost all the guidelines issued by AICTE/UGC.

S. No.	Broad Course Classification	Course Group/ Category	Course Description
1	Foundation Courses (FnC)	BS – Basic Sciences	Includes mathematics, physics and chemistry subjects
2		ES - Engineering Sciences	Includes fundamental engineering subjects
3		HS – Humanities and Social sciences	Includes subjects related to humanities, social sciences and management
4	Core Courses (CoC)	PC – Professional Core	Includes core subjects related to the parent discipline/ department/ branch of Engineering.
5	Elective Courses (EℓC)	PE – Professional Electives	Includes elective subjects related to the parent discipline/ department/ branch of Engineering.
6		OE – Open Electives	Elective subjects which include inter-disciplinary subjects or subjects in an area outside the parent discipline/ department/ branch of Engineering.
7	Core Courses	Project Work	B.Tech. project or UG project or UG major project or Project Stage I & II
8		Industrial training/ Mini- project	Industrial training/ Summer Internship/ Industrial Oriented Mini-project/ Mini-project

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9		Seminar	Seminar/ Colloquium based on core contents related to parent discipline/ department/ branch of Engineering.
10	Minor courses	-	1 or 2 Credit courses (subset of HS)
11	Mandatory Courses (MC)	-	Mandatory courses (non-credit)

4.0 Course registration

4.1 A 'faculty advisor or counselor' shall be assigned to a group of 20 students, who will advise the students about the under graduate programme, its course structure and curriculum, choice/option for subjects/ courses, based on their competence, progress, pre-requisites and interest.

4.2 The academic section of the college invites 'registration forms' from students before the beginning of the semester through 'on-line registration', ensuring 'date and time stamping'. The on-line registration requests for any 'current semester' shall be **completed before the commencement of SEEs (Semester End Examinations) of the 'preceding semester'**.

4.3 A student can apply for **on-line** registration, **only after** obtaining the **'written approval'** from faculty advisor/counselor, which should be submitted to the college academic section through the Head of the Department. A copy of it shall be retained with Head of the Department, faculty advisor/ counselor and the student.

4.4 A student may be permitted to register for all the subjects/ courses in a semester as specified in the course structure with maximum additional subject(s)/course(s) limited to 4 credits, based on **progress** and SGPA/ CGPA, and completion of the **'pre-requisites'** as indicated for various subjects/ courses, in the department course structure and syllabus contents.

4.5 Choice for **'additional subjects/ courses'** must be clearly indicated, which needs the specific approval and signature of the faculty advisor/ counselor.

4.6 If the student submits ambiguous choices or multiple options or erroneous entries during **on-line** registration for the subject(s) / course(s) under a given/ specified course group/ category as listed in the course structure, only the first mentioned subject/ course in that category will be taken into consideration.

4.7 Subject/ course options exercised through **on-line** registration are final and **cannot** be changed or inter-changed; further, alternate choices also will not be considered. However, if the subject/ course that has already been listed for registration by the Head of the Department in a semester could not be offered due to any unforeseen or unexpected reasons, then the student shall be allowed to have alternate choice either for a new subject (subject to offering of such a subject), or for another existing subject (subject to availability of seats). Such alternate arrangements will be made by the head

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of the department, with due notification and time-framed schedule, within the **first week** after the commencement of class-work for that semester.

4.8 Dropping of subjects/ courses may be permitted, only after obtaining prior approval from the faculty advisor/ counselor 'within a period of 15 days' from the beginning of the current semester.

4.9 **Open electives**: The students have to choose three open electives (OE-I, II & III) from the list of open electives given. However, the student cannot opt for an open elective subject offered by his own (parent) department, if it is already listed under any category of the subjects offered by parent department in any semester.

4.10 **Professional electives**: The students have to choose six professional electives (PE-I to VI) from the list of professional electives given.

5.0 **Subjects/ courses to be offered**

5.1 A typical section (or class) strength for each semester shall be 60.

5.2 A subject/ course may be offered to the students, **only if** a minimum of 20 students (1/3 of the section strength) opt for it. The maximum strength of a section is limited to 80 (60 + 1/3 of the section strength).

5.3 More than **one faculty member** may offer the **same subject** (lab/ practical may be included with the corresponding theory subject in the same semester) in any semester. However, selection of choice for students will be based on - '**first come first serve** basis and CGPA criterion' (i.e. the first focus shall be on early **on-line entry** from the student for registration in that semester, and the second focus, if needed, will be on CGPA of the student).

5.4 If more entries for registration of a subject come into picture, then the Head of the Department concerned shall decide, whether or not to offer such a subject/ course for **two (or multiple) sections**.

5.5 In case of options coming from students of other departments/ branches/ disciplines (not considering **open electives**), first **priority** shall be given to the student of the '**parent department**'.

6.0 **Attendance requirements:**

6.1 A student shall be eligible to appear for the semester end examinations, if the student acquires a minimum of 75% of attendance in aggregate of all the subjects/ courses (excluding attendance in mandatory courses like Environmental Science, Constitution of India, Intellectual Property Rights, and Gender Sensitization lab) for that semester. Two periods of attendance for each theory subject shall be considered, if the student appears for the mid-term examination of that subject. **This attendance should also be included in the fortnightly upload of attendance to the University.**

The attendance of Mandatory Non-Credit courses should be uploaded separately to the University.

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6.2 Shortage of attendance in aggregate up to 10% (65% and above, and below 75%) in each semester may be condoned by the college academic committee on genuine and valid grounds, based on the student's representation with supporting evidence.

6.3 A stipulated fee shall be payable for condoning of shortage of attendance.

6.4 Shortage of attendance below 65% in aggregate shall in **no** case be condoned.

6.5 **Students whose shortage of attendance is not condoned in any semester are not eligible to take their end examinations of that semester. They get detained and their registration for that semester shall stand cancelled. They will not be promoted to the next semester.** They may seek re-registration for all those subjects registered in that semester in which the student is detained, by seeking re-admission into that semester as and when offered; if there are any professional electives and/ or open electives, the same may also be re-registered if offered. However, if those electives are not offered in later semesters, then alternate electives may be chosen from the **same** set of elective subjects offered under that category.

6.6 A student fulfilling the attendance requirement in the present semester shall not be eligible for readmission into the same class.

7.0 Academic requirements

The following academic requirements have to be satisfied, in addition to the attendance requirements mentioned in item no.**6.**

7.1 A student shall be deemed to have satisfied the academic requirements and earned the credits allotted to each subject/ course, if student secures not less than 35% (26 marks out of 75 marks) in the semester end examination, and a minimum of 40% (40 marks out of 100 marks) in the sum total of the CIE (Continuous Internal Evaluation) and SEE (Semester End Examination) taken together; in terms of letter grades, this implies securing **'C'** grade or above in that subject/ course.

7.2 A student shall be deemed to have satisfied the academic requirements and earned the credits allotted to Industrial Oriented Mini Project/Summer Internship and seminar, if the student secures not less than 40% marks (i.e. 40 out of 100 allotted marks) in each of them. The student is deemed to have failed, if he (i) does not submit a report on Industrial Oriented Mini Project/Summer Internship, or does not make a presentation of the same before the evaluation committee as per schedule, or (ii) does not present the seminar as required in the IV year I Semester, or (iii) secures less than 40% marks in Industrial Oriented Mini Project/Summer Internship and seminar evaluations.

A student may reappear once for each of the above evaluations, when they are scheduled again; if the student fails in such 'one reappearance' evaluation also, the student has to reappear for the same in the next subsequent semester, as and when it is scheduled.

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7.3 Promotion Rules

S. No.	Promotion	Conditions to be fulfilled
1	First year first semester to first year second semester	Regular course of study of first year first semester.
2	First year second semester to second year first semester	(i) Regular course of study of first year second semester. (ii) Must have secured at least 18 credits out of 37 credits i.e., 50% credits up to first year second semester from all the relevant regular and supplementary examinations, whether the student takes those examinations or not.
3.	Second year first semester to second year second semester	Regular course of study of second year first semester.
4	Second year second semester to third year first semester	(i) Regular course of study of second year second semester. (ii) Must have secured at least 47 credits out of 79 credits i.e., 60% credits up to second year second semester from all the relevant regular and supplementary examinations, whether the student takes those examinations or not.
5	Third year first semester to third year second semester	Regular course of study of third year first semester.
6	Third year second semester to fourth year first semester	(i) Regular course of study of third year second semester. (ii) Must have secured at least 73 credits out of 123 credits i.e., 60% credits up to third year second semester from all the relevant regular and supplementary examinations, whether the student takes those examinations or not.
7	Fourth year first semester to fourth year second semester	Regular course of study of fourth year first semester.

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7.4 A student (i) shall register for all courses/subjects covering 160 credits as specified and listed in the course structure, (ii) fulfills all the attendance and academic requirements for 160 credits, (iii) earn all 160 credits by securing SGPA ≥ 5.0 (in each semester), and CGPA (at the end of each successive semester) ≥ 5.0, (iv) **passes all the mandatory courses,** to successfully complete the under graduate programme. The performance of the student in these 160 credits shall be taken into account for the calculation of 'the final CGPA **(at the end of under graduate programme),** and shall be indicated in the grade card of IV year II semester.

7.5 If a student registers for '**extra subjects**' (in the parent department or other departments/branches of Engg.) other than those listed subjects totaling to 160 credits as specified in the course structure of his department, the performances in those '**extra subjects**' (although evaluated and graded using the same procedure as that of the required 160 credits) will not be taken into account while calculating the SGPA and CGPA. For such '**extra subjects**' registered, percentage of marks and letter grade alone will be indicated in the grade card as a performance measure, subject to completion of the attendance and academic requirements as stated in regulations 6 and 7.1 – 7.4 above.

7.6 A student eligible to appear in the semester end examination for any subject/ course, but absent from it or failed (thereby failing to secure '**C**' grade or above) may reappear for that subject/ course in the supplementary examination as and when conducted. In such cases, internal marks (CIE) assessed earlier for that subject/ course will be carried over, and added to the marks to be obtained in the SEE supplementary examination for evaluating performance in that subject.

7.7 A student **detained in a semester due to shortage of attendance may be re-admitted in the same semester in the next academic year for fulfillment of academic requirements**. The academic regulations under which a student has been readmitted shall be applicable. However, no grade allotments or SGPA/ CGPA calculations will be done for the entire semester in which the student has been detained.

7.8 A student detained **due to lack of credits, shall be promoted to the next academic year only after acquiring the required academic credits.** The academic regulations under which the student has been readmitted shall be applicable to him.

8.0 Evaluation - Distribution and Weightage of marks

8.1 The performance of a student in every subject/course (including practicals and Project Stage – I & II) will be evaluated for 100 marks each, with 25 marks allotted for CIE (Continuous Internal Evaluation) and 75 marks for SEE (Semester End-Examination).

8.2 For theory subjects, during a semester, there shall be two mid-term examinations. Each mid-term examination consists of one objective paper, one descriptive paper and one assignment. The objective paper and the descriptive paper shall be for 10 marks each with a total duration of 1 hour 20 minutes (20 minutes for objective and 60 minutes for descriptive paper). The objective paper is set with 20 multiple choice, fill-

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in the blanks and matching type of questions for a total of 10 marks. The descriptive paper shall contain 4 full questions out of which, the student has to answer 2 questions, each carrying 5 marks. While the first mid-term examination shall be conducted on 50% of the syllabus, the second mid-term examination shall be conducted on the remaining 50% of the syllabus. Five marks are allocated for assignments (as specified by the subject teacher concerned). The first assignment should be submitted before the conduct of the first mid-term examination, and the second assignment should be submitted before the conduct of the second mid-term examination. The total marks secured by the student in each mid-term examination are evaluated for 25 marks, and the average of the two mid-term examinations shall be taken as the final marks secured by each student in Continuous Internal Evaluation. If any student is absent from any subject of a mid-term examination, an on-line test will be conducted for him by the University. The details of the end semester question paper pattern are as follows:

8.2.1 The semester end examinations (SEE) will be conducted for 75 marks consisting of two parts viz. i) **Part- A** for 25 marks, ii) **Part - B** for 50 marks.

- Part-A is a compulsory question consisting of ten sub-questions. The first five sub-questions are from each unit and carry 2 marks each. The next five sub-questions are one from each unit and carry 3 marks each.
- Part-B consists of five questions (numbered from 2 to 6) carrying 10 marks each. Each of these questions is from one unit and may contain sub-questions. For each question there will be an "either" "or" choice, which means that there will be two questions from each unit and the student should answer either of the two questions.

8.2.2 For subjects like **Engineering Graphics/Engineering Drawing,** the SEE shall consist of five questions. For each question there will be an "either" "or" choice, which means that there will be two questions from each unit and the student should answer either of the two questions. There shall be no Part – A, and Part – B system.

8.2.3 For subjects like **Machine Drawing Practice/Machine Drawing**, the SEE shall be conducted for 75 marks consisting of two parts viz. (i) Part – A for 30 marks. 3 out of 4 questions must be answered, (ii) Part – B for 45 marks. Part – B is compulsory.

8.2.4 For the Subject **Estimation, Costing and Project Management**, the SEE paper should consist of Part- A, Part-B and Part C. (i) Part – A – 1 out of 2 questions from Unit – I for 30 Marks, (ii) Part – B – 1 out of 2 questions from Unit – II for 15 Marks, (iii) Part – C – 3 out of 5 questions from Units – III, IV, V for 30 Marks.

8.2.5 For subjects **Structural Engineering – I & II (RCC & STEEL),** the SEE will be conducted for 75 marks consisting of 2 parts viz. (i) Part – A for 15 marks and, (i) Part – B for 60 marks. Part – A is a compulsory question consisting of ten sub-questions. The first five sub-questions are from each unit relating to design theory and codal provisions and carry 2 marks each. The next five sub-questions are from each unit and carry 1 mark each. Part – B consists of 5 questions (numbered 2 to 6)

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carrying 12 marks each. Each of these questions is from one unit and may contain sub-questions. For each question there is either or choice, which means that there will be two questions from each unit and the student should answer either of the two questions.

8.3 For practical subjects there shall be a continuous internal evaluation during the semester for 25 marks and 75 marks for semester end examination. Out of the 25 marks for internal evaluation, day-to-day work in the laboratory shall be evaluated for 15 marks and internal practical examination shall be evaluated for 10 marks conducted by the laboratory teacher concerned. The semester end examination shall be conducted with an external examiner and the laboratory teacher. The external examiner shall be appointed from the clusters of colleges which are decided by the examination branch of the University.

8.4 For the subject having design and/or drawing, (such as engineering graphics, engineering drawing, machine drawing, machine drawing practice and estimation), the distribution shall be 25 marks for continuous internal evaluation (15 marks for day-to-day work and 10 marks for internal tests) and 75 marks for semester end examination. There shall be two internal tests in a semester and the average of the two shall be considered for the award of marks for internal tests.

8.5 There shall be an Industrial Oriented Mini Project/Summer Internship, in collaboration with an industry of their specialization. Students will register for this immediately after III year II semester examinations and pursue it during summer vacation. Industrial Oriented Mini Project/Summer Internship shall be submitted in a report form and presented before the committee in IV year I semester. It shall be evaluated for 100 external marks. The committee consists of an external examiner, Head of the Department, supervisor of the Industrial Oriented mini project/Summer Internship and a senior faculty member of the department. There shall be no internal marks for Industrial Oriented Mini Project/Summer Internship.

8.6 There shall be a seminar presentation in IV year I semester. For the seminar, the student shall collect the information on a specialized topic, prepare a technical report, and submit it to the department. It shall be evaluated by the departmental committee consisting of Head of the Department, seminar supervisor and a senior faculty member. The seminar report shall be evaluated for 100 internal marks. There shall be no semester end examination for the seminar.

8.7 UG project work shall be carried out in two stages: Project Stage – I during IV Year I Semester, Project Stage – II during IV Year II Semester. Each stage will be evaluated for 100 marks. Student has to submit project work report at the end of each semester. First report includes project work carried out in IV Year I semester and second report includes project work carried out in IV Year I & II Semesters. SEE for both project stages shall be completed before the commencement of SEE Theory examinations.

8.8 For Project Stage – I, the departmental committee consisting of Head of the Department, project supervisor and a senior faculty member shall evaluate the project

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work for 75 marks and project supervisor shall evaluate for 25 marks. The student is deemed to have failed, if he (i) does not submit a report on Project Stage - I or does not make a presentation of the same before the evaluation committee as per schedule, or (ii) secures less than 40% marks in the sum total of the CIE and SEE taken together.

A student who has failed may reappear once for the above evaluation, when it is scheduled again; if he fails in such 'one reappearance' evaluation also, he has to reappear for the same in the next subsequent semester, as and when it is scheduled.

8.9 For Project Stage – II, the external examiner shall evaluate the project work for 75 marks and the project supervisor shall evaluate it for 25 marks. The topics for industrial oriented mini project, seminar and Project Stage – I shall be different from one another. The student is deemed to have failed, if he (i) does not submit a report on Project Stage - II, or does not make a presentation of the same before the external examiner as per schedule, or (ii) secures less than 40% marks in the sum total of the CIE and SEE taken together.

For conducting viva-voce of project stage – II, University selects an external examiner from the list of experts in the relevant branch submitted by the Principal of the College.

A student who has failed may reappear once for the above evaluation, when it is scheduled again; if student fails in such 'one reappearance' evaluation also, he has to reappear for the same in the next subsequent semester, as and when it is scheduled.

8.10 The laboratory marks and the internal marks awarded by the college are subject to scrutiny and scaling by the University wherever necessary. In such cases, the internal and laboratory marks awarded by the college will be referred to a committee. The committee will arrive at a scaling factor and the marks will be scaled accordingly. The recommendations of the committee are final and binding. The laboratory records and internal test papers shall be preserved in the respective institutions as per the University rules and produced before the committees of the University as and when asked for.

8.11 For mandatory courses of Environmental Science, Constitution of India, Intellectual Property Rights, and Gender Sensitization lab, a student has to secure 40 marks out of 100 marks (i.e. 40% of the marks allotted) in the continuous internal evaluation for passing the subject/course. **These marks should also be uploaded along with the internal marks of other subjects.**

8.12 No marks or letter grades shall be allotted for mandatory/non-credit courses. Only Pass/Fail shall be indicated in Grade Card.

9.0 Grading procedure

9.1 Grades will be awarded to indicate the performance of students in each theory subject, laboratory / practicals, seminar, Industry Oriented Mini Project, and project Stage - I & II. Based on the percentage of marks obtained (Continuous Internal Evaluation plus

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Semester End Examination, both taken together) as specified in item 8 above, a corresponding letter grade shall be given.

9.2 As a measure of the performance of a student, a 10-point absolute grading system using the following letter grades (as per UGC/AICTE guidelines) and corresponding percentage of marks shall be followed:

% of Marks Secured in a Subject/Course (Class Intervals)	Letter Grade (UGC Guidelines)	Grade Points
Greater than or equal to 90%	O (Outstanding)	10
80 and less than 90%	A^+ (Excellent)	9
70 and less than 80%	A (Very Good)	8
60 and less than 70%	B^+ (Good)	7
50 and less than 60%	B (Average)	6
40 and less than 50%	C (Pass)	5
Below 40%	F (FAIL)	0
Absent	Ab	0

9.3 A student who has obtained an **'F'** grade in any subject shall be deemed to have **'failed'** and is required to reappear as a 'supplementary student' in the semester end examination, as and when offered. In such cases, internal marks in those subjects will remain the same as those obtained earlier.

9.4 To a student who has not appeared for an examination in any subject, **'Ab'** grade will be allocated in that subject, and he is deemed to have **'failed'**. A student will be required to reappear as a 'supplementary student' in the semester end examination, as and when offered next. In this case also, the internal marks in those subjects will remain the same as those obtained earlier.

9.5 A letter grade does not indicate any specific percentage of marks secured by the student, but it indicates only the range of percentage of marks.

9.6 A student earns grade point (GP) in each subject/ course, on the basis of the letter grade secured in that subject/ course. The corresponding 'credit points' (CP) are computed by multiplying the grade point with credits for that particular subject/ course.

Credit points (CP) = grade point (GP) x credits .... For a course

9.7 A student passes the subject/ course only when **GP ≥ 5 ('C' grade or above)**

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9.8 The Semester Grade Point Average (SGPA) is calculated by dividing the sum of credit points (ΣCP) secured from all subjects/ courses registered in a semester, by the total number of credits registered during that semester. SGPA is rounded off to **two** decimal places. SGPA is thus computed as

$$\textbf{SGPA} = \{ \sum_{i=1}^{N} C_i \, G_i \} / \{ \sum_{i=1}^{N} C_i \} \text{ .... For each semester,}$$

where 'i' is the subject indicator index (takes into account all subjects in a semester), 'N' is the no. of subjects '**registered**' for the semester (as specifically required and listed under the course structure of the parent department), C_i is the no. of credits allotted to the i^{th} subject, and G_i represents the grade points (GP) corresponding to the letter grade awarded for that i^{th} subject.

9.9 The Cumulative Grade Point Average (CGPA) is a measure of the overall cumulative performance of a student in all semesters considered for registration. The CGPA is the ratio of the total credit points secured by a student in **all** registered courses in **all** semesters, and the total number of credits registered in **all** the semesters. CGPA is rounded off to **two** decimal places. CGPA is thus computed from the I year II semester onwards at the end of each semester as per the formula

$$\textbf{CGPA} = \{ \sum_{j=1}^{M} C_j \, G_j \} / \{ \sum_{j=1}^{M} C_j \} \text{ ... for all S semesters registered}$$

(i.e., up to and inclusive of S semesters, S ≥ 2),

where '**M**' is the **total** no. of subjects (as specifically required and listed under the course structure of the parent department) the student has '**registered**' i.e., from the 1^{st} semester onwards up to and inclusive of the 8^{th} semester, 'j' is the subject indicator index (takes into account all subjects from 1 to 8 semesters), C_j is the no. of credits allotted to the j^{th} subject, and G_j represents the grade points (GP) corresponding to the letter grade awarded for that j^{th} subject. After registration and completion of I year I semester, the SGPA of that semester itself may be taken as the CGPA, as there are no cumulative effects.

Illustration of calculation of SGPA:

Course/Subject	Credits	Letter Grade	Grade Points	Credit Points
Course 1	4	A	8	4 x 8 = 32
Course 2	4	O	10	4 x 10 = 40
Course 3	4	C	5	4 x 5 = 20
Course 4	3	B	6	3 x 6 = 18
Course 5	3	A+	9	3 x 9 = 27
Course 6	3	C	5	3 x 5 = 15
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SGPA = 152/21 = 7.24

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Illustration of calculation of CGPA up to 3rd semester:

Semester	Course/Subject Title	Credits Allotted	Letter Grade Secured	Corresponding Grade Point (GP)	Credit Points (CP)
I	Course 1	3	A	8	24
I	Course 2	3	O	10	30
I	Course 3	3	B	6	18
I	Course 4	4	A	8	32
I	Course 5	3	A+	9	27
I	Course 6	4	C	5	20
II	Course 7	4	B	6	24
II	Course 8	4	A	8	32
II	Course 9	3	C	5	15
II	Course 10	3	O	10	30
II	Course 11	3	B+	7	21
II	Course 12	4	B	6	24
II	Course 13	4	A	8	32
II	Course 14	3	O	10	30
III	Course 15	2	A	8	16
III	Course 16	1	C	5	5
III	Course 17	4	O	10	40
III	Course 18	3	B+	7	21
III	Course 19	4	B	6	24
III	Course 20	4	A	8	32
III	Course 21	3	B+	7	21
	Total Credits	**69**		**Total Credit Points**	**518**

CGPA = 518/69 = 7.51

The above illustrated calculation process of CGPA will be followed for each subsequent semester until 8th semester. The CGPA obtained at the end of 8th semester will become the final CGPA secured for entire B.Tech. Programme.

9.10 For merit ranking or comparison purposes or any other listing, **only** the **'rounded off'** values of the CGPAs will be used.

9.11 SGPA and CGPA of a semester will be mentioned in the semester Memorandum of Grades if all subjects of that semester are passed in first attempt. Otherwise the SGPA and CGPA shall be mentioned only on the Memorandum of Grades in which sitting he passed his last exam in that semester. However, mandatory courses will not be taken into consideration.

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10.0 Passing standards

10.1 A student shall be declared successful or 'passed' in a semester, if he secures a GP ≥ 5 ('C' grade or above) in every subject/course in that semester (i.e. when the student gets an SGPA ≥ 5.00 at the end of that particular semester); and he shall be declared successful or 'passed' in the entire under graduate programme, only when gets a CGPA ≥ 5.00 for the award of the degree as required.

10.2 After the completion of each semester, a grade card or grade sheet shall be issued to all the registered students of that semester, indicating the letter grades and credits earned. It will show the details of the courses registered (course code, title, no. of credits, grade earned, etc.), credits earned.

11.0 Declaration of results

11.1 Computation of SGPA and CGPA are done using the procedure listed in 9.6 to 9.9.

11.2 For final percentage of marks equivalent to the computed final CGPA, the following formula may be used.

% of Marks = (final CGPA – 0.5) x 10

12.0 Award of degree

12.1 A student who registers for all the specified subjects/ courses as listed in the course structure and secures the required number of 160 credits (with CGPA ≥ 5.0), within 8 academic years from the date of commencement of the first academic year, shall be declared to have '**qualified**' for the award of B.Tech. degree in the chosen branch of Engineering selected at the time of admission.

12.2 A student who qualifies for the award of the degree as listed in item 12.1 shall be placed in the following classes.

12.3 A student with final CGPA (at the end of the under graduate programme) ≥ 8.00, and fulfilling the following conditions - shall be placed in '**first class with distinction**'. However, he

(i) Should have passed all the subjects/courses in '**first appearance**' within the first 4 academic years (or 8 sequential semesters) from the date of commencement of first year first semester.

(ii) Should have secured a CGPA ≥ 8.00, at the end of each of the 8 sequential semesters, starting from I year I semester onwards.

(iii) Should not have been detained or prevented from writing the semester end examinations in any semester due to shortage of attendance or any other reason.

A student not fulfilling any of the above conditions with final CGPA > 8 shall be placed in '**first class**'.

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12.4 Students with final CGPA (at the end of the under graduate programme) ≥ 6.50 but < 8.00 shall be placed in **'first class'.**

12.5 Students with final CGPA (at the end of the under graduate programme) ≥ 5.50 but < 6.50, shall be placed in '**second class**'.

12.6 All other students who qualify for the award of the degree (as per item 12.1), with final CGPA (at the end of the under graduate programme) ≥ 5.00 but < 5.50, shall be placed in '**pass class**'.

12.7 A student with final CGPA (at the end of the under graduate programme) < 5.00 will not be eligible for the award of the degree.

12.8 Students fulfilling the conditions listed under item 12.3 alone will be eligible for award of '**Gold Medal**'.

13.0 Withholding of results

13.1 If the student has not paid the fees to the University at any stage, or has dues pending due to any reason whatsoever, or if any case of indiscipline is pending, the result of the student may be withheld, and the student will not be allowed to go into the next higher semester. The award or issue of the degree may also be withheld in such cases.

14.0 Student transfers

14.1 There shall be no branch transfers after the completion of admission process.

14.2 There shall be no transfers from one college/stream to another within the constituent colleges and units of Jawaharlal Nehru Technological University Hyderabad.

14.3 The students seeking transfer to colleges affiliated to JNTUH from various other Universities/institutions have to pass the failed subjects which are equivalent to the subjects of JNTUH, and also pass the subjects of JNTUH which the students have not studied at the earlier institution. Further, though the students have passed some of the subjects at the earlier institutions, if the same subjects are prescribed in different semesters of JNTUH, the students have to study those subjects in JNTUH in spite of the fact that those subjects are repeated.

14.4 The transferred students from other Universities/institutions to JNTUH affiliated colleges who are on rolls are to be provided one chance to write the CBT (internal marks) in the **equivalent subject(s)** as per the clearance letter issued by the University.

14.5 The autonomous affiliated colleges have to provide one chance to write the internal examinations in the **equivalent subject(s)** to the students transferred from other universities/institutions to JNTUH autonomous affiliated colleges who are on rolls, as per the clearance (equivalence) letter issued by the University.

15.0 Scope

15.1 The academic regulations should be read as a whole, for the purpose of any interpretation.

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15.2 In case of any doubt or ambiguity in the interpretation of the above rules, the decision of the Vice-Chancellor is final.

15.3 The University may change or amend the academic regulations, course structure or syllabi at any time, and the changes or amendments made shall be applicable to all students with effect from the dates notified by the University authorities.

15.4 Where the words "he", "him", "his", occur in the regulations, they include "she", "her", "hers".

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JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

(Established by State Act No. 30 of 2008)

Kukatpally, Hyderabad, Telangana (India).

ACADEMIC REGULATIONS FOR B.TECH. (LATERAL ENTRY SCHEME) FROM THE AY 2019-20

1. **Eligibility for award of B. Tech. Degree (LES)**

   The LES students after securing admission shall pursue a course of study for not less than three academic years and not more than six academic years.

2. The student shall register for 123 credits and secure 123 credits with CGPA ≥ 5 from II year to IV year B.Tech. programme (LES) for the award of B.Tech. degree.

3. The students, who fail to fulfil the requirement for the award of the degree in six academic years from the year of admission, shall forfeit their seat in B.Tech.

4. The attendance requirements of B. Tech. (Regular) shall be applicable to B.Tech. (LES).

5. **Promotion rule**

S. No	Promotion	Conditions to be fulfilled
1	Second year first semester to second year second semester	Regular course of study of second year first semester.
2	Second year second semester to third year first semester	(i) Regular course of study of second year second semester. (ii) Must have secured at least 25 credits out of 42 credits i.e., 60% credits up to second year second semester from all the relevant regular and supplementary examinations, whether the student takes those examinations or not.
3	Third year first semester to third year second semester	Regular course of study of third year first semester.
4	Third year second semester to fourth year first semester	(i) Regular course of study of third year second semester.

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		(ii) Must have secured at least 51 credits out of 86 credits i.e., 60% credits up to third year second semester from all the relevant regular and supplementary examinations, whether the student takes those examinations or not.
5	**Fourth year first semester to fourth year second semester**	**Regular course of study of fourth year first semester.**

6. All the other regulations as applicable to B. Tech. 4-year degree course (Regular) will hold good for B. Tech. (Lateral Entry Scheme).

MALPRACTICES RULES

DISCIPLINARY ACTION FOR / IMPROPER CONDUCT IN EXAMINATIONS

	Nature of Malpractices/Improper conduct	Punishment
	If the student:	
1. (a)	Possesses or keeps accessible in examination hall, any paper, note book, programmable calculators, cell phones, pager, palm computers or any other form of material concerned with or related to the subject of the examination (theory or practical) in which student is appearing but has not made use of (material shall include any marks on the body of the student which can be used as an aid in the subject of the examination)	Expulsion from the examination hall and cancellation of the performance in that subject only.
(b)	Gives assistance or guidance or receives it from any other student orally or by any other body language methods or communicates through cell phones with any student or persons in or outside the exam hall in respect of any matter.	Expulsion from the examination hall and cancellation of the performance in that subject only of all the students involved. In case of an outsider, he will be handed over to the police and a case is registered against him.
2.	Has copied in the examination hall from any paper, book, programmable calculators, palm computers or any other form of material relevant to the subject of the examination (theory or	Expulsion from the examination hall and cancellation of the performance in that subject and all other subjects the student has already appeared including practical examinations and project work and shall not be permitted to

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	practical) in which the student is appearing.	appear for the remaining examinations of the subjects of that semester/year. The hall ticket of the student is to be cancelled and sent to the University.
3.	Impersonates any other student in connection with the examination.	The student who has impersonated shall be expelled from examination hall. The student is also debarred and forfeits the seat. The performance of the original student who has been impersonated, shall be cancelled in all the subjects of the examination (including practicals and project work) already appeared and shall not be allowed to appear for examinations of the remaining subjects of that semester/year. The student is also debarred for two consecutive semesters from class work and all University examinations. The continuation of the course by the student is subject to the academic regulations in connection with forfeiture of seat. If the imposter is an outsider, he will be handed over to the police and a case is registered against him.
4.	Smuggles in the answer book or additional sheet or takes out or arranges to send out the question paper during the examination or answer book or additional sheet, during or after the examination.	Expulsion from the examination hall and cancellation of performance in that subject and all the other subjects the student has already appeared including practical examinations and project work and shall not be permitted for the remaining examinations of the subjects of that semester/year. The student is also debarred for two consecutive semesters from class work and all University examinations. The continuation of the course by the student is subject to the academic regulations in connection with forfeiture of seat.
5.	Uses objectionable, abusive or offensive language in the answer paper or in letters to the examiners or writes to the examiner requesting him to award pass marks.	Cancellation of the performance in that subject.
6.	Refuses to obey the orders of the chief superintendent/assistant – superintendent / any officer on duty or	In case of students of the college, they shall be expelled from examination halls and cancellation of their performance in that

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	misbehaves or creates disturbance of any kind in and around the examination hall or organizes a walk out or instigates others to walk out, or threatens the officer-in charge or any person on duty in or outside the examination hall of any injury to his person or to any of his relations whether by words, either spoken or written or by signs or by visible representation, assaults the officer-in-charge, or any person on duty in or outside the examination hall or any of his relations, or indulges in any other act of misconduct or mischief which result in damage to or destruction of property in the examination hall or any part of the college campus or engages in any other act which in the opinion of the officer on duty amounts to use of unfair means or misconduct or has the tendency to disrupt the orderly conduct of the examination.	subject and all other subjects the student(s) has (have) already appeared and shall not be permitted to appear for the remaining examinations of the subjects of that semester/year. The students also are debarred and forfeit their seats. In case of outsiders, they will be handed over to the police and a police case is registered against them.
7.	Leaves the exam hall taking away answer script or intentionally tears off the script or any part thereof inside or outside the examination hall.	Expulsion from the examination hall and cancellation of performance in that subject and all the other subjects the student has already appeared including practical examinations and project work and shall not be permitted for the remaining examinations of the subjects of that semester/year. The student is also debarred for two consecutive semesters from class work and all University examinations. The continuation of the course by the student is subject to the academic regulations in connection with forfeiture of seat.
8.	Possesses any lethal weapon or firearm in the examination hall.	Expulsion from the examination hall and cancellation of the performance in that subject and all other subjects the student has already appeared including practical examinations and project work and shall not be permitted for the remaining examinations of the subjects of that semester/year. The student is also debarred and forfeits the seat.

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9.	If student of the college, who is not a student for the particular examination or any person not connected with the college indulges in any malpractice or improper conduct mentioned in clause 6 to 8.	Expulsion from the examination hall and cancellation of the performance in that subject and all other subjects the student has already appeared including practical examinations and project work and shall not be permitted for the remaining examinations of the subjects of that semester/year. The student is also debarred and forfeits the seat. Person(s) who do not belong to the college will be handed over to the police and, a police case will be registered against them.
10.	Comes in a drunken condition to the examination hall.	Expulsion from the examination hall and cancellation of the performance in that subject and all other subjects the student has already appeared for including practical examinations and project work and shall not be permitted for the remaining examinations of the subjects of that semester/year.
11.	Copying detected on the basis of internal evidence, such as, during valuation or during special scrutiny.	Cancellation of the performance in that subject and all other subjects the student has appeared for including practical examinations and project work of that semester/year examinations.
12.	If any malpractice is detected which is not covered in the above clauses 1 to 11 shall be reported to the University for further action to award a suitable punishment.	

Malpractices identified by squad or special invigilators

1. Punishments to the students as per the above guidelines.
2. Punishment for institutions : (if the squad reports that the college is also involved in encouraging malpractices)
   a. A show cause notice shall be issued to the college.
   b. Impose a suitable fine on the college.
   c. Shifting the examination centre from one college to another college for a specific period of not less than one year.

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ACADEMIC CALENDAR 2021-22

B. TECH./B.PHARM. II YEAR I & II SEMESTERS

I SEM

S. No	Description	Duration	
		From	To
1	Dussehra Recess	11.10.2021	16.10.2021 (1 Week)
2	Commencement of I Semester classwork	**18.10.2021**	
3	1st Spell of Instructions	18.10.2021	11.12.2021 (8 Weeks)
4	First Mid Term Examinations	13.12.2021	18.12.2021 (1 Week)
5	Submission of First Mid Term Exam Marks to the University on or before	24.12.2021	
6	2nd Spell of Instructions	20.12.2021	12.02.2022 (8 Weeks)
7	Second Mid Term Examinations	14.02.2022	19.02.2022 (1 Week)
8	Preparation Holidays and Practical Examinations	21.02.2022	26.02.2022 (1 Week)
9	Submission of Second Mid Term Exam Marks to the University on or before	26.02.2022	
10	End Semester Examinations	28.02.2022	12.03.2022 (2 Weeks)

II SEM

S. No	Description	Duration	
		From	To
1	Commencement of II Semester classwork	**14.03.2022**	
2	1st Spell of Instructions (including Summer Vacation)	14.03.2022	28.05.2022 (11Weeks)
3	Summer Vacation	09.05.2022	21.05.2022 (2 Weeks)
4	First Mid Term Examinations	30.05.2022	04.06.2022 (1 Week)
5	Submission of First Mid Term Exam Marks to the University on or before	11.06.2022	
6	2nd Spell of Instructions	06.06.2022	30.07.2022 (8 Weeks)
7	Second Mid Term Examinations	01.08.2022	06.08.2022 (1 Week)
8	Preparation Holidays and Practical Examinations	09.08.2022	16.08.2022 (1 Week)
9	Submission of Second Mid Term Exam Marks to the University on or before	16.08.2022	
10	End Semester Examinations	17.08.2022	30.08.2022 (2 Weeks)

REGISTRAR 30/12/21

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Academic Calendar 2021-22

B. TECH./B.PHARM. III & IV YEARS I & II SEMESTERS

I SEM

S. No	Description	Duration	
		From	To
1	Commencement of I Semester classwork	06.092021	
2	1st Spell of Instructions (including Dussehra Recess)	06.09.2021	06.11.2021 (9 Weeks)
3	Dussehra Recess	11.10.2021	16.10.2021 (1 Week)
4	First Mid Term Examinations	08.11.2021	13.11.2021 (1 Week)
5	Submission of First Mid Term Exam Marks to the University on or before	20.11.2021	
6	2nd Spell of Instructions	15.11.2021	08.01.2022 (8 Weeks)
7	Second Mid Term Examinations	10.01.2022	18.01.2022 (1 Week)
8	Preparation Holidays and Practical Examinations	19.01.2022	25.01.2022 (1 Week)
9	Submission of Second Mid Term Exam Marks to the University on or before	25.01.2022	
10	End Semester Examinations	27.01.2022	09.02.2022

II SEM

S. No	Description	Duration	
		From	To
1	Commencement of II Semester classwork	10.02.2022	
2	1st Spell of Instructions	10.02.2022	06.04.2022 (8 Weeks)
3	First Mid Term Examinations	07.04.2022	13.04.2022 (1 Week)
4	Submission of First Mid Term Exam Marks to the University on or before	20.04.2022	
5	2nd Spell of Instructions (including Summer Vacation)	16.04.2022	24.06.2022 (10 Weeks)
6	Summer Vacation	09.05.2022	21.05.2022 (2 Weeks)
7	Second Mid Term Examinations	25.06.2022	01.07.2022 (1 Week)
8	Preparation Holidays and Practical Examinations	02.07.2022	09.07.2022 (1 Week)
9	Submission of Second Mid Term Exam Marks to the University on or before	09.07.2022	
10	End Semester Examinations	11.07.2022	23.07.2022 (2 Weeks)

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DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

DEPARTMENT ACADEMIC CALENDAR (2021-22)

B. TECH-I-SEM			DATE: 28/08/2021
S.No.	EVENT	DATE FROM	DATE TO
1.	Mini Project initiation IV Year	31-08-2021	
2.	Commencement of Class work for III and IV Year	06-09-2021	
3.	UNIT – I Instructions for III & IV years	06-09-2021	25-09-2021
4.	Submission of Mini Project Abstract to the department	18-09-2021	
5.	Finalization of Mini Project	25-09-2021	
6.	UNIT – II Instructions for III & IV years	27-09-2021	23-10-2021
7.	Mini Project Abstract level review	08-10-2021	09-10-2021
8.	Assignment Test -1 for III & IV years	05-10-2021	09-10-2021
9.	Dussehra Recess	11-10-2021	16-10-2021
10.	Commencement of Class work for II Year	18-10-2021	
11.	UNIT – I Instructions for II year	18-10-2021	06-11-2021
12.	Spell I UNIT – III Instructions for III & IV years	25-10-2021	06-11-2021
13.	Mini Project Review – I	05-11-2021	06-11-2021
14.	Assignment Test -1 for II year	08-11-2021	10-11-2021
15.	UNIT – II Instructions for II year	08-11-2021	27-11-2021
16.	University I-Mid-Examination for III & IV Years	08-11-2021	13-11-2021
17.	Lab Internal-1 for III & IV Years	15-11-2021	17-11-2021
18.	Spell II UNIT – III Instructions for II,III & IV years	15-11-2021	20-11-2021
19.	Submission of I mid marks of III & IV year to the University	20-11-2021	

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S.No.	EVENT	DATE FROM	DATE TO
20.	Unit- IV Instructions for III & IV years	22-11-2021	08-12-2021
21.	Spell I UNIT – III Instructions for II year	29-11-2021	11-12-2022
22.	Mini Project Review – II	03-12-2021	04-12-2021
23.	Assignment Test -2 for III & IV years	09-12-2021	11-12-2021
24.	Spell for Unit-V Instructions for III & IV years	09-12-2021	23-12-2021
25.	University I-Mid-Examination for II Year	13-12-2021	18-12-2021
26.	Submission of I mid marks of II year to the University	20-11-2021	
27.	Lab Internal-1 for II Year	20-12-2021	22-12-2021
28.	Spell II UNIT – III Instructions for II Year	20-12-2021	29-12-2021
29.	Lab Internal-2 for III & IV Years	27-12-2021	29-12-2021
30.	Mini Project Review – III (Project Exhibition)	30-12-2021	31-12-2021
31.	Unit- IV Instructions for II years	30-12-2021	15-01-2022
32.	Pre final exams for III & IV Years	03-01-2022	07-01-2022
33.	University II-Mid-Exam- III & IV Year	10-01-2022	18-01-2022
34.	Assignment Test -2 for II year	17-01-2022	19-01-2022
35.	Unit- V Instructions for II years	17-01-2022	29-01-2022
36.	Practical Examinations and II mid Examination- III & IV Year	02-02-2022	28-02-2022
37.	Submission of II Mid marks of III & Iv year to university	02-03-2022	
38.	End Semester Examination - III & IV Year	09-02-2022	02-03-2022
39.	Lab Internal-2 for II Year	31-01-2022	02-02-2022
40.	Pre final exams for II Year	07-02-2022	11-02-2022
41.	University II-Mid-Exam- II Year	14-02-2022	19-02-2022
42.	Practical Examinations - II Year	21-02-2020	26-02-2022

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43.	Submission of II mid marks of II year to the University	26-02-2021	
44.	End Semester Examination - II Year	28-02-2022	12-03-2022

Tentative Dates for Events

S.No.	EVENT	DATE
1.	Workshop for II years	Fourth Week of August
2.	Workshop for III years	Fourth Week of August
3.	Workshop for IV years	Third Week of August
4.	Seminar for II years	Third Week of August
5.	Seminar for III years	Third Week of September
6.	Seminar for IV years	Fourth Week of August
7.	Industrial visit for II years	Third Week of September
8.	Industrial visit for III years	First Week of September
9.	Industrial visit for IV years	Second Week of September
10.	ADDON Courses for II, III & IV Year	Fourth Week of September
11.	Entrepreneurship Awareness Camp	Second week of November

HOD
Head of the Department
Electronics and Communication Engine
Vignan's Institute of Management and Technology for
Kondapur (V), Ghatkesar (M), R.R. Dist-50

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DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

DEPARTMENT ACADEMIC CALENDAR (2021-22)

I YEAR M. TECH-I-SEM		DATE: 13/11/2021	
S.No.	**EVENT**	**DATE FROM**	**DATE TO**
1.	Commencement of Class work	15-11-2021	
2.	1st Spell of Instruction	15-11-2021	08-01-2022
3.	University I-Mid-Exam	04-01-2022	09-01-2022
4.	Submission of I mid marks to the university	25-01-2022	
5.	2nd Spell of Instruction	17-01-2022	19-03-2022
6.	University II-Mid-Exam	21-03-2022	26-03-2022
7.	Practical Examinations	28-03-2022	01-04-2022
8.	Submission of II mid marks to the University	04-04-2022	
9.	End Semester Examination	04-04-2022	20-04-2022

HOD

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Electronics and Communication Engineering
Vignan's Institute of Management and Technology for Wo
Kondapur (V), Ghatkesar (M), R.R. Dist-501 3

Vignan's Institute of Management & Technology For Women
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DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

DEPARTMENT ACADEMIC CALENDAR (2021-22)

B. TECH-II-SEM		DATE: 28/03/2022	
S.No.	EVENT	DATE FROM	DATE TO
1.	1st Spell of Instructions for III &IV years	03.03.2022	30.04.2022
2.	Spell for UNIT – I Instructions for III &IV years	03.03.2022	22.03.2022
3.	Major project Stage- 2 for IV years	11.3.2022	12.3.2022
4.	Holi Holiday	17.03.2022	
5.	Assignment test-1 on Unit –I for III Year	21.03.2022	22.03.2022
6.	1st Spell of Instructions for II Year	21.03.2022	28.05.2022
7.	Spell for UNIT – I Instructions for II year	21.03.2022	09.04.2022
8.	Spell for UNIT –II Instructions for III &IV years	23.03.2022	09.04.2022
9.	Ugadi Holiday	02.04.2022	
10.	Assignment test-1 on Unit –I for II Year	08.04.2022	09.042022
11.	Assignment test-2 on Unit –2 for III Year	08.04.2022	09.04.2022
12.	Spell for UNIT – III Instructions for III &IV years	11.04.2022	30.04.2022
13.	Spell for UNIT –II Instructions for II year	11.04.2022	30.04.2022
14.	Ambedkar Jayanthi	14.04.2022	
15.	Good Friday	15.04.2022	-
16.	Major project Stage- 3 for IV years	16.04.2022	
17.	Lab Exam -Internal-1	25.04.2022	30.04.2022
18.	Assignment test-2 on Unit –2 for II Year	28.04.2022	29.04.2022
19.	Spell for UNIT – III Instructions for II year	01.05.2022	14.05.2022
20.	University Mid-I Exams for III &IV year	02.05.2022	07.05.2022
21.	2nd Spell of Instructions for IV Year	09.05.2022	02.07.2022

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S.No.	EVENT	DATE FROM	DATE TO
22.	2nd Spell of Instructions for III Year	09.05.2022	20.07.2022
23.	Summer Vacation	15.05.2022	29.05.2022
24.	Spell for UNIT – IV Instructions for IV year	09.05.2022	30.05.2022
25.	Spell for UNIT – IV Instructions for III year	09.05.2022	16.06.2022
26.	University Mid-I Exams for II years	30.05.2022	04.06.2022
27.	Spell for UNIT – V Instructions for IV year	02.06.2022	20.06.2022
28.	Assignment test-3 on Unit –IV for IV Year	05.06.2022	21.06.2022
29.	Major project Final Review for IV years	03.06.2022	04.06.2022
30.	2nd Spell of Instructions for II Year	06.06.2022	08.08.2022
31.	Spell for UNIT – IV Instructions for II year	06.06.2022	25.06.2022
32.	Submission of I Mid marks of II year to the university	11.06.2022	
33.	Spell for UNIT – V Instructions for III years	13.06.2022	11.07.2022
34.	Spell for UNIT – IV Instructions for II year	27.06.2022	25.06.2022
35.	Assignment test-3 on Unit –IV for II Year	27.06.2022	29.06.2022
36.	Assignment test-3 on Unit –IV for III Year	27.06.2022	29.06.2022
37.	Pre final exams for IV years	27.06.2022	29.06.2022
38.	Spell for UNIT – V Instructions for II year	27.06.2022	25.07.2022
39.	University Mid-II Exams for IV years	04.07.2022	09.07.2022
40.	Submission of II Mid marks of IV year to the university	09.07.2022	
41.	IV Year End Examinations	11.07.2022	16.07.2022
42.	Pre final exams for III years	13.07.2022	15.07.2022
43.	University Mid-II Exams for III years	21.07.2022	02.08.2022
44.	Pre final exams for II years	01.08.2022	05.08.2022

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S.No.	EVENT	DATE FROM	DATE TO
45.	Submission of II Mid marks of III year to the university	10.08.2022	
46.	III Year End Examinations	10.08.2022	23.08.2022
47.	University Mid-II Exams for II years	10.08.2022	17.08.2022
48.	Practical Examinations	18.08.2022	24.08.2022
49.	Submission of II Mid marks of III year to the university	24.08.2022	
50.	II Year End Examinations	25.08.2022	08.09.2022
51.	Practical Examinations	03.08.2022	09.08.2022

Tentative Dates for Events

S.No.	EVENT	DATE
1.	Workshop for II years	Fourth Week of April
2.	Workshop for III years	Third Week of March
3.	Seminar for II years	Fourth Week of April
4.	Seminar for III years	First Week of April
5.	Industrial visit for II years	Third Week of September
6.	Industrial visit for III years	First Week of September
7.	ADDON Courses for II, III & IV Year	Fourth Week of February
8.	Entrepreneurship Awareness Camp	Second week of April

HOD

Head of the Department
Electronics and Communication Engineering
Vignan's Institute of Management and Technology
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DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

DEPARTMENT ACADEMIC CALENDAR (2021-22)

I YEAR M. TECH-II-SEM			DATE: 16/04/2022
S.No.	EVENT	DATE FROM	DATE TO
1.	Commencement of Class work	21-04-2022	
2.	1st Spell of Instruction	15-05-2022	02-07-2022
3.	Summer Vacations	15.05.2022	29.05.2022
4.	University I-Mid-Exam	04-07-2022	09-07-2022
5.	Submission of I mid marks to the university	23-07-2022	
6.	2nd Spell of Instruction	18-07-2022	10-09-2022
7.	University II-Mid-Exam	12-09-2022	17-09-2022
8.	Practical Examinations	19-09-2022	24-09-2022
9.	Submission of II mid marks to the University	24-09-2022	
10.	End Semester Examination	26-09-2022	15-10-2022

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Electronics and Communication Engineering
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EXAMINATION BRANCH

III YEAR B.TECH – II SEMESTER– R18 REGULATION I - MID TERM EXAMINATIONS MAY-2022-(IN OFFLINE MODE)

TIMETABLE

TIME→ FN: 9.40 AM TO 11.00 AM (DESCRIPTIVE EXAM: 9.40 AM TO 10.40 AM, OBECTIVE EXAM: 10.40 AM TO 11.00 AM)
AN: 1.40 PM TO 03.00 PM (DESCRIPTIVE EXAM: 1.40 PM TO 2.40 PM, OBECTIVE EXAM: 2.40 PM TO 03.00 PM)

BRANCH	02-05-2022 FN MONDAY	02-05-2022 AN MONDAY	05-05-2022 FN THURSDAY	05-05-2022 AN THURSDAY	06-05-2022 FN FRIDAY	06-05-2022 AN FRIDAY
ELECTRONICS AND COMMUNICATION ENGINEERING (04-ECE)	Antennas and Propagation	Digital Signal Processing	E2	E2	VLSI Design	(OE1)
			Object Oriented Programming through Java	Embedded System Design		Disaster Preparedness & Planning Management
						Entrepreneurship
						Fundamentals of Management for Engineers
						Cyber Law & Ethics
						Basics of Sensors Technology
						Reliability Engineering
						Renewable Energy Sources
						Quantitative Analysis for Business Decisions
				Mobile Communications and Networks		Industrial Management
						Non-Conventional Energy Sources
						General Geology
						Testing of Materials
						Alloy Steels
						Introduction to Mining Technology
						Coal Gasification, CBM & Shale Gas

20-04-2022

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EXAMINATION BRANCH

III YEAR B.TECH – II SEMESTER– R18 REGULATION I - MID TERM EXAMINATIONS MAY-2022-(IN OFFLINE MODE)

TIMETABLE

TIME→ FN: 9.40 AM TO 11.00 AM (DESCRIPTIVE EXAM: 9.40 AM TO 10.40 AM, OBECTIVE EXAM: 10.40 AM TO 11.00 AM)
AN: 1.40 PM TO 03.00 PM (DESCRIPTIVE EXAM: 1.40 PM TO 2.40 PM, OBECTIVE EXAM: 2.40 PM TO 03.00 PM)

BRANCH	02-05-2022 FN MONDAY	02-05-2022 AN MONDAY	05-05-2022 FN THURSDAY	05-05-2022 AN THURSDAY	06-05-2022 FN FRIDAY	06-05-2022 AN FRIDAY
-		-		-		(OE1)
				E3		Disaster Preparedness & Planning Management
						Basics of Sensors Technology
				Concurrent Programming		Fundamentals of Internet of Things
						Reliability Engineering
						Renewable Energy Sources
COMPUTER SCIENCE AND ENGINEERING	Machine Learning	Compiler Design	Design and Analysis of Algorithms	Network Programming	-	Quantitative Analysis for Business Decisions
						Industrial Management
(05-CSE)						
						Non-Conventional Energy Sources
				Scripting Languages		General Geology
						Testing of Materials
				Mobile Application Development		Alloy Steels
						Introduction to Mining Technology
				Software Testing Methodologies		Coal Gasification, CBM & Shale Gas

Date: 20-04-2022

Vignan's Institute of Management & Technology For Women
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EXAMINATION BRANCH

III YEAR B.TECH – II SEMESTER– R18 REGULATION I - MID TERM EXAMINATIONS MAY-2022-(IN OFFLINE MODE)

TIMETABLE

TIME→ FN: 9.40 AM TO 11.00 AM (DESCRIPTIVE EXAM: 9.40 AM TO 10.40 AM, OBECTIVE EXAM: 10.40 AM TO 11.00 AM)
AN: 1.40 PM TO 03.00 PM (DESCRIPTIVE EXAM: 1.40 PM TO 2.40 PM, OBECTIVE EXAM: 2.40 PM TO 03.00 PM)

BRANCH	02-05-2022 FN MONDAY	02-05-2022 AN MONDAY	05-05-2022 FN THURSDAY	05-05-2022 AN THURSDAY	06-05-2022 FN FRIDAY	06-05-2022 AN FRIDAY
INFORMATION TECHNOLOGY (12- I T)	Introduction to Embedded Systems	Principles of Compiler Construction	Algorithm Design and Analysis	E3	Internet of Things	(OE1)
				Ethical Hacking		Disaster Preparedness & Planning Management
				Network Programming		Basics of Sensors Technology
				Scripting Languages		Fundamentals of Internet of Things
						Reliability Engineering
						Renewable Energy Sources
				Mobile Application Development		Quantitative Analysis for Business Decisions
						Industrial Management
				Software Testing Methodologies		Non-Conventional Energy Sources
						General Geology
						Testing of Materials
						Alloy Steels
						Introduction to Mining Technology
						Coal Gasification, CBM & Shale Gas

Date: 20-04-2022

Vignan's Institute of Management & Technology For Women Kondapur (V), Ghatkesar (M), Medchal Malkajgiri (Dt.) Pin-501301 (T.S.)

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EXAMINATION BRANCH

IV YEAR B.TECH – II SEMESTER– R18 REGULATION I - MID TERM EXAMINATIONS MAY-2022-(IN OFFLINE MODE)

TIMETABLE

TIME→ FN: 11.40 AM TO 1.00 PM (DESCRIPTIVE EXAM: 11.40 AM TO 12.40 PM, OBECTIVE EXAM:12.40 PM TO 1.00 PM)
AN: 3.40 PM TO 5.00 PM (DESCRIPTIVE EXAM: 3.40 PM TO 04. 40 PM, OBECTIVE EXAM: 4.40 PM TO 05.00 PM)

BRANCH	02-05-2022 FN MONDAY	02-05-2022 AN MONDAY	05-05-2022 FN THURSDAY
ELECTRICAL AND ELECTRONICS ENGINEERING (02-EEE)	E5 Power Quality & FACTS	E6 Smart Grid Technologies	OE3
	Control Systems Design	Electrical Distribution Systems	Database Management Systems
	AI Techniques in Electrical Engineering		Elements of Rocket Propulsion
			Basics of Virtual Instrumentation
			Environmental Impact Assessment
			Fundamentals of Robotics
		Advanced Control of Electric Drives	Green Fuel Technologies
			High Temperature Materials
			Light Metals and Alloys
			Linear and Non-Linear Optimization Techniques
			Mobile Application Development
			Machine Learning
			Measuring Instruments
			Non-Conventional Sources of energy
			Remote Sensing and GIS in Mining
			Total Quality Management
			Solid Fuel Technology
			Scripting Languages

Date: 20-04-2022

Vignan's Institute of Management & Technology for Women, Kondapur (V), Ghatkesar (M), Medchal, Malkajgiri (Dt.), Pin-501301 (T.S.)

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EXAMINATION BRANCH

IV YEAR B.TECH – II SEMESTER– R18 REGULATION I - MID TERM EXAMINATIONS MAY-2022-(IN OFFLINE MODE)

TIMETABLE

TIME→ FN: 11.40 AM TO 1.00 PM (DESCRIPTIVE EXAM: 11.40 AM TO 12.40 PM, OBECTIVE EXAM:12.40 PM TO 1.00 PM)
AN: 3.40 PM TO 5.00 PM (DESCRIPTIVE EXAM: 3.40 PM TO 04. 40 PM, OBECTIVE EXAM: 4.40 PM TO 05.00 PM)

BRANCH	02-05-2022 FN MONDAY	02-05-2022 AN MONDAY	05-05-2022 FN THURSDAY
ELECTRONICS AND COMMUNICATION ENGINEERING (04-ECE)	E5	E6	**OE3**
			Basics of Power Plant Engineering
	Satellite Communications	System on Chip Architecture	Database Management Systems
			Elements of Rocket Propulsion
	Radar Systems	Test and Testability	Energy Sources and Applications
			Environmental Impact Assessment
			Fundamentals of Robotics
			Green Fuel Technologies
	Wireless Sensor Networks	Low Power VLSI Design	High Temperature Materials
			Light Metals and Alloys
			Linear and Non-Linear Optimization Techniques
			Mobile Application Development
			Machine Learning
			Non-Conventional Sources of energy
			Basics of Virtual Instrumentation
			Remote Sensing and GIS in Mining
			Total Quality Management
			Solid Fuel Technology
			Scripting Languages

Date: 20-04-2022

Vignan's Institute of Management & Technology For Women Kondapur (V), Ghatkesar (M), Medchal, Malkajgiri (Dt.) Pin-501301 (T.S.)

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EXAMINATION BRANCH

IV YEAR B.TECH – II SEMESTER– R18 REGULATION I - MID TERM EXAMINATIONS MAY-2022-(IN OFFLINE MODE)

TIMETABLE

TIME→ FN: 11.40 AM TO 1.00 PM (DESCRIPTIVE EXAM: 11.40 AM TO 12.40 PM, OBECTIVE EXAM:12.40 PM TO 1.00 PM)
AN: 3.40 PM TO 5.00 PM (DESCRIPTIVE EXAM: 3.40 PM TO 04. 40 PM, OBECTIVE EXAM: 4.40 PM TO 05.00 PM)

BRANCH	02-05-2022 FN MONDAY	02-05-2022 AN MONDAY	05-05-2022 FN THURSDAY
COMPUTER SCIENCE AND ENGINEERING (05-CSE)	Organizational Behaviour	E6	OE2
		Computational Complexity	Basics of Power Plant Engineering
		Distributed Systems	Elements of Rocket Propulsion
			Energy Sources and Applications
		Neural Networks & Deep Learning	Environmental Impact Assessment
			Fundamentals of Robotics
		Cyber Forensics	Green Fuel Technologies
			High Temperature Materials
		Human Computer Interaction	Light Metals and Alloys
			Measuring Instruments
			Non-Conventional Sources of energy
			Remote Sensing and GIS in Mining
			Total Quality Management
			Solid Fuel Technology
			Basics of Virtual Instrumentation
			Linear and Non-Linear Optimization Techniques

Date: 20-04-2022

Vignan's Institute of Management & Technology For Women, Kondapur (V), Ghatkesar (M), Medchal, Malkajgiri (Dt.) Pin-501301 (T.S.)

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EXAMINATION BRANCH

III YEAR B.TECH – II SEMESTER– R18 REGULATION II - MID TERM EXAMINATIONS JULY-2022-(IN OFFLINE MODE)

TIMETABLE

TIME→ FN: 9.40 AM TO 11.00 AM (DESCRIPTIVE EXAM: 9.40 AM TO 10.40 AM, OBJECTIVE EXAM: 10.40 AM TO 11.00 AM)
AN: 1.40 PM TO 03.00 PM (DESCRIPTIVE EXAM: 1.40 PM TO 2.40 PM, OBJECTIVE EXAM: 2.40 PM TO 03.00 PM)

BRANCH	11-07-2022 FN MONDAY	11-07-2022 AN MONDAY	12-07-2022 FN TUESDAY	12-07-2022 AN TUESDAY	16-07-2022 FN SATURDAY	16-07-2022 AN SATURDAY
ELECTRONICS AND COMMUNICATION ENGINEERING (04-ECE)	Antennas and Propagation	Digital Signal Processing	E2	E2	VLSI Design	(OE1)
			Object Oriented Programming through Java	Embedded System Design		Disaster Preparedness & Planning Management
				Mobile Communications and Networks		Entrepreneurship
						Fundamentals of Management for Engineers
						Cyber Law & Ethics
						Basics of Sensors Technology
						Reliability Engineering
						Renewable Energy Sources
						Quantitative Analysis for Business Decisions
						Industrial Management
						Non-Conventional Energy Sources
						General Geology
						Testing of Materials
						Alloy Steels
						Introduction to Mining Technology
						Coal Gasification, CBM & Shale Gas

01-07-2022

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Telangana State

Sd/-
CONTROLLER OF EXAMINATIONS

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

KUKATPALLY, HYDERABAD – 500085

EXAMINATION BRANCH

III YEAR B.TECH – II SEMESTER– R18 REGULATION II - MID TERM EXAMINATIONS JULY-2022-(IN OFFLINE MODE)

TIMETABLE

TIME→ FN: 9.40 AM TO 11.00 AM (DESCRIPTIVE EXAM: 9.40 AM TO 10.40 AM, OBJECTIVE EXAM: 10.40 AM TO 11.00 AM)
AN: 1.40 PM TO 03.00 PM (DESCRIPTIVE EXAM: 1.40 PM TO 2.40 PM, OBJECTIVE EXAM: 2.40 PM TO 03.00 PM)

BRANCH	11-07-2022 FN MONDAY	11-07-2022 AN MONDAY	12-07-2022 FN TUESDAY	12-07-2022 AN TUESDAY	16-07-2022 FN SATURDAY	16-07-2022 AN SATURDAY
COMPUTER SCIENCE AND ENGINEERING (05-CSE)	Machine Learning	Compiler Design	Design and Analysis of Algorithms	E3	–	(OE1)
				Concurrent Programming		Disaster Preparedness & Planning Management
				Network Programming		Basics of Sensors Technology
				Scripting Languages		Fundamentals of Internet of Things
				Mobile Application Development		Reliability Engineering
				Software Testing Methodologies		Renewable Energy Sources
						Quantitative Analysis for Business Decisions
						Industrial Management
						Non-Conventional Energy Sources
						General Geology
						Testing of Materials
						Alloy Steels
						Introduction to Mining Technology
						Coal Gasification, CBM & Shale Gas

Date: 01-07-2022

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CONTROLLER OF EXAMINATIONS

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KUKATPALLY, HYDERABAD – 500085

EXAMINATION BRANCH

III YEAR B.TECH – II SEMESTER– R18 REGULATION II - MID TERM EXAMINATIONS JULY-2022-(IN OFFLINE MODE)

TIMETABLE

TIME→ FN: 9.40 AM TO 11.00 AM (DESCRIPTIVE EXAM: 9.40 AM TO 10.40 AM, OBJECTIVE EXAM: 10.40 AM TO 11.00 AM)
AN: 1.40 PM TO 03.00 PM (DESCRIPTIVE EXAM: 1.40 PM TO 2.40 PM, OBJECTIVE EXAM: 2.40 PM TO 03.00 PM)

BRANCH	11-07-2022 FN MONDAY	11-07-2022 AN MONDAY	12-07-2022 FN TUESDAY	12-07-2022 AN TUESDAY	16-07-2022 FN SATURDAY	16-07-2022 AN SATURDAY
INFORMATION TECHNOLOGY (12- I T)	Introduction to Embedded Systems	Principles of Compiler Construction	Algorithm Design and Analysis	E3	Internet of Things	(OE1)
				Ethical Hacking		Disaster Preparedness & Planning Management
				Network Programming		Basics of Sensors Technology
				Scripting Languages		Fundamentals of Internet of Things
						Reliability Engineering
						Renewable Energy Sources
						Quantitative Analysis for Business Decisions
				Mobile Application Development		Industrial Management
						Non-Conventional Energy Sources
						General Geology
						Testing of Materials
						Alloy Steels
				Software Testing Methodologies		Introduction to Mining Technology
						Coal Gasification, CBM & Shale Gas

Date: 01-07-2022

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EXAMINATION BRANCH

IV YEAR B.TECH – II SEMESTER– R18 REGULATION II - MID TERM EXAMINATIONS JULY-2022-(IN OFFLINE MODE)

TIMETABLE

TIME→ FN: 9.40 AM TO 11.00 AM (DESCRIPTIVE EXAM: 9.40 AM TO 10.40 AM, OBJECTIVE EXAM: 10.40 AM TO 11.00 AM)
AN: 1.40 PM TO 03.00 PM (DESCRIPTIVE EXAM: 1.40 PM TO 2.40 PM, OBJECTIVE EXAM: 2.40 PM TO 03.00 PM

BRANCH	04-07-2022 FN MONDAY	04-07-2022 AN MONDAY	05-07-2022 FN TUESDAY
ELECTRICAL AND ELECTRONICS ENGINEERING (02-EEE)	E5 Power Quality & FACTS	E6 Smart Grid Technologies	OE3
	Control Systems Design	Electrical Distribution Systems	Database Management Systems
	AI Techniques in Electrical Engineering		Elements of Rocket Propulsion
			Basics of Virtual Instrumentation
			Environmental Impact Assessment
			Fundamentals of Robotics
		Advanced Control of Electric Drives	Green Fuel Technologies
			High Temperature Materials
			Light Metals and Alloys
			Linear and Non-Linear Optimization Techniques
			Mobile Application Development
			Machine Learning
			Measuring Instruments
			Non-Conventional Sources of energy
			Remote Sensing and GIS in Mining
			Total Quality Management
			Solid Fuel Technology
			Scripting Languages

Date: 23-06-2022

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EXAMINATION BRANCH

IV YEAR B.TECH – II SEMESTER– R18 REGULATION II - MID TERM EXAMINATIONS JULY-2022-(IN OFFLINE MODE)

TIMETABLE

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AN: 1.40 PM TO 03.00 PM (DESCRIPTIVE EXAM: 1.40 PM TO 2.40 PM, OBJECTIVE EXAM: 2.40 PM TO 03.00 PM)

BRANCH	04-07-2022 FN MONDAY	04-07-2022 AN MONDAY	05-07-2022 FN TUESDAY
ELECTRONICS AND COMMUNICATION ENGINEERING (04-ECE)	E5	E6	**OE3**
			Basics of Power Plant Engineering
	Satellite Communications	System on Chip Architecture	Database Management Systems
			Elements of Rocket Propulsion
	Radar Systems	Test and Testability	Energy Sources and Applications
			Environmental Impact Assessment
			Fundamentals of Robotics
			Green Fuel Technologies
	Wireless Sensor Networks	Low Power VLSI Design	High Temperature Materials
			Light Metals and Alloys
			Linear and Non-Linear Optimization Techniques
			Mobile Application Development
			Machine Learning
			Non-Conventional Sources of energy
			Basics of Virtual Instrumentation
			Remote Sensing and GIS in Mining
			Total Quality Management
			Solid Fuel Technology
			Scripting Languages

Date: 23-06-2022

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BRANCH	04-07-2022 FN MONDAY	04-07-2022 AN MONDAY	05-07-2022 FN TUESDAY
COMPUTER SCIENCE AND ENGINEERING (05-CSE)	Organizational Behaviour	E6	OE3
		Computational Complexity	Basics of Power Plant Engineering
		Distributed Systems	Elements of Rocket Propulsion
			Energy Sources and Applications
		Neural Networks & Deep Learning	Environmental Impact Assessment
			Fundamentals of Robotics
		Cyber Forensics	Green Fuel Technologies
			High Temperature Materials
		Human Computer Interaction	Light Metals and Alloys
			Measuring Instruments
			Non-Conventional Sources of energy
			Remote Sensing and GIS in Mining
			Total Quality Management
			Solid Fuel Technology
			Basics of Virtual Instrumentation
			Linear and Non-Linear Optimization Techniques

Date: 23-06-2022

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CSE & ECE

III- B.Tech II Semester I-Mid Examinations, May-2022

Branch & Sections: III –ECE A&B

Sub: **VLSI Design (Set - 2)**

Time: 60mins | Date: 06.05.2022 (FN) | Max. Marks: 20M

Answer all Questions — **2 X 10=20M**

Sl. No.	Question	CO Mapping	Blooms Taxonomy Level	Marks
1	With neat diagrams explain the fabrication of nMOS transistor	CO1	Remember	10
	OR			
2	Explain the steps involved in VLSI design flow	CO2	Understand	10
3.a)	Distinguish between enhancement and Depletion mode transistor action in NMOS.	CO1	Evaluate	5
3.b)	Draw the neat layout diagram of CMOS inverter	CO2	Understand	5
	OR			
4	Draw the stick diagram for the following Boolean expression using CMOS logic . F=A(B+C)			10

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CSE & ECE

III- B.Tech II Semester I-Mid Examinations, May-2022

Branch & Sections: III –ECE A&B

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III- B.Tech II Semester I-Mid Examinations, May-2022

Roll Number

Branch & Sections: III- ECE – A & B
Academic Year: 2021-22
Sub: **VLSI Design**

Time: 20mins
Max. Marks: 10
Date: 06.05.2022 (FN)

SET-2

Answer all Questions
Part-A 10 X 0.5 = 5
Multiple choice Questions

No.	Question	A	B	C	D	Answer
1	Switching speed of a MOS device depends on ______	gate voltage above a threshold	carrier mobility	length channel	all of the mentioned	[d]
2	Inverters are essential for ______	NAND gates	NOR gates	sequential circuits	all of the mentioned	[d]
3	CMOS inverter has ______ output impedance	low	high	very high	none of the mentioned	[a]
4	In linear region ______ channel exists	uniform	non-uniform	wide	uniform and wide	a
5	The oxide layer below the first metal layer is deposited using ______	diffusion method	chemical vapour deposition	solid deposition	scattering method	[b]
6	For constant voltage model,	$\alpha = \beta$	$\alpha = 1$	$\alpha = 1/\beta$	$\beta = 1$	[d]
7	Which gives scalable design rules?	lambda rules	micron rules	layer rules	thickness rules	[a]

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No.	Question	A	B	C	D	Answer
8	Which type of contact cuts are better?	buried contacts	butted contacts	butted & buried contacts	none of the mentioned	[a]
9	Features of switch logic approach	occupies more area	no undesirable threshold voltage	low power dissipation	all of the mentioned	[d]
10	The switch logic approach takes ______ static current	low	more	no	very less	[C]

Answer all Questions
Part-B 10 X 0.5 = 5
Fill in the Blanks

No.	Question	Answer
1.	In nMOS inverter configuration depletion mode device is called as ______	Pull up
2.	What is the ratio of Zp.u/Zp.d for an NMOS inverter driven by another NMOS inverter	4/1
3.	The BJTs in the BICMOS circuit is in ______ configuration	Totem pole
4.	Guard rings prevent the formation of ______ and contact cuts	parasitic transistors
5.	Which color is used for implant?	Yellow
6.	α is used for scaling ______	Linear dimensions
7.	What should be the spacing between two diffusion layers?	3λ
8.	Gate area is scaled by ______	$1/\alpha^2$
9.	When the NMOS is turned ON in pseudo NMOS logic dynamic power is ______	decreased
10.	In dynamic CMOS logic ______ clock is used	[illegible]

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III - B.Tech II semester I Mid Examinations,

Branch & sections: III - ECE A & B

Sub: VLSI Design (Set-2)

Date of Exam: 06-05-2022 (FN)

Scheme of Evaluation:

1) fabrication steps along with equivalent diagrams — 10M.

2) flow-chart - 5M.

Explaination of flow chart - 5M.

3) a) Differences b/w enhancement mode & depletion mode nMOS - 5M.

b) Basic CMOS inverter diagram - 2M

layout of CMOS Inverter - 3M

4) Basic diagram for a given function.

Equivalent stick diagram (6M) (4M)

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Mid-I

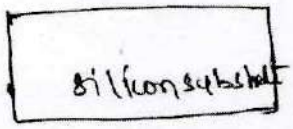
VLSI Design.

Evaluation Key

(1) With neat diagram explain the fabrication of nmos transistor – 10M

Ans. Step1:- Substrate.

processing is carried on single crystal silicon with high purity, on which required P impurities are introduced as crystal is grown



Step2:- Thick oxide:- A layer of SiO_2 typically 1µm thick is grown all over the surface of the wafer to protect the surface.

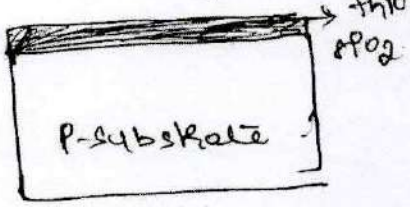
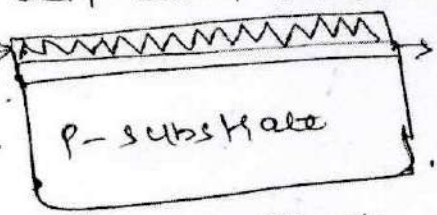
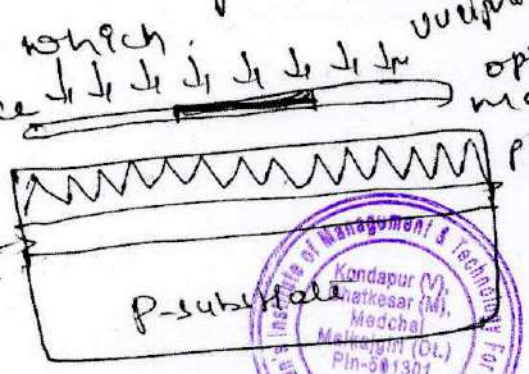


Photo resist:- The surface is now covered with the photo resist which is deposited on to the wafer and spun to an even distribution of the required thickness.



Step4:- Exposing to UV light through mask. The photo resist layer is then exposed to ultraviolet light through masking which defines those regions into which diffusion, is to take place with together with the transistor channels



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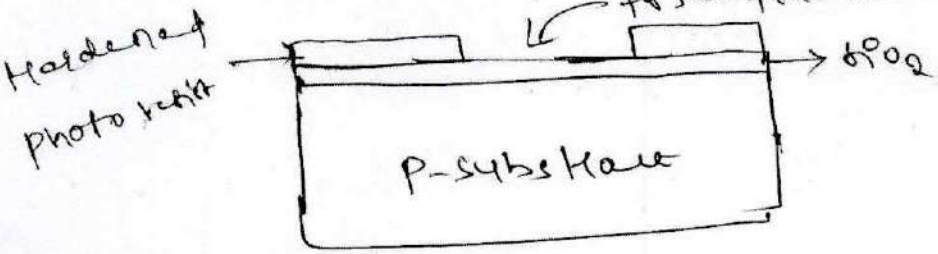
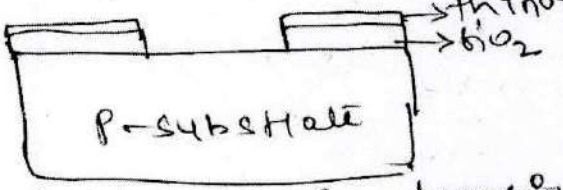
Step5: Etching the oxide layer:

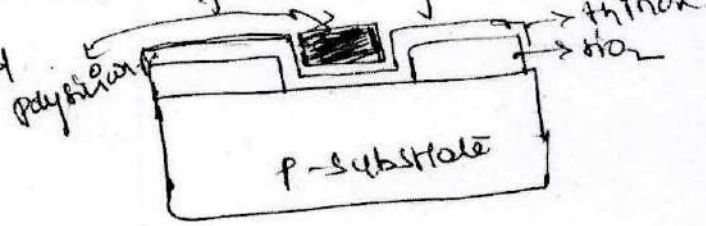
These areas are subsequently readily etched away together with the underlying SiO_2 so that the wafer surface is exposed in the window defined by the mask. Hydrofluoric acid.



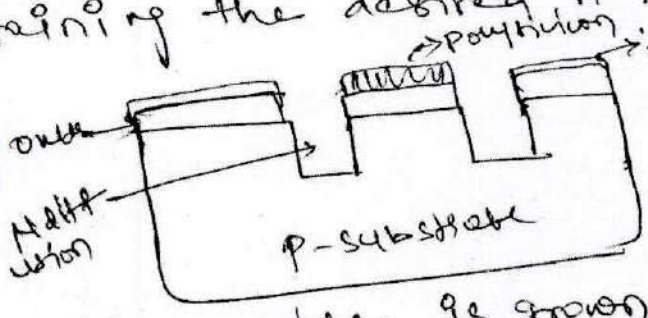
Step6: Thin oxide: A thin layer of SiO_2 is grown over the entire chip surface.



Step7: patterning poly.: polysilicon is deposited on the top of this to form gate structure the polysilicon layer consists of heavily doped polysilicon deposited by chemical vapor deposition.



Step8: N Diffusion: Diffusion is achieved by heating the wafer to a high temperature and passing a gas containing the desired n-type impurity.



Step9: Contact cuts: Thick oxide is grown all over again and is then masked with photo resist and etched to expose selected

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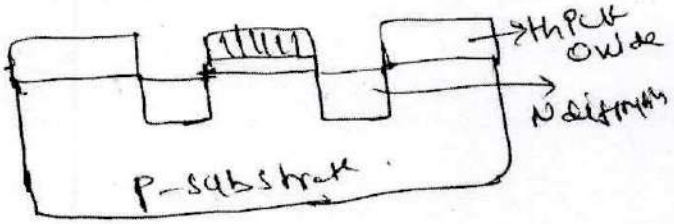
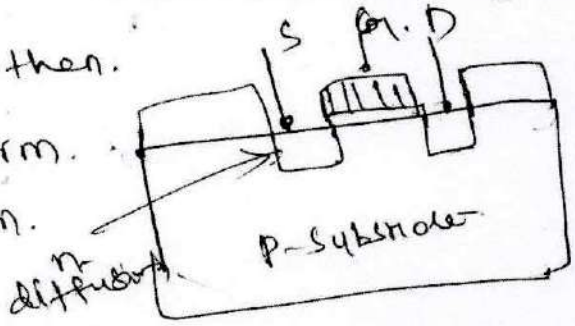
areas of the polysilicon gate and the drain and source areas where connections are to be made



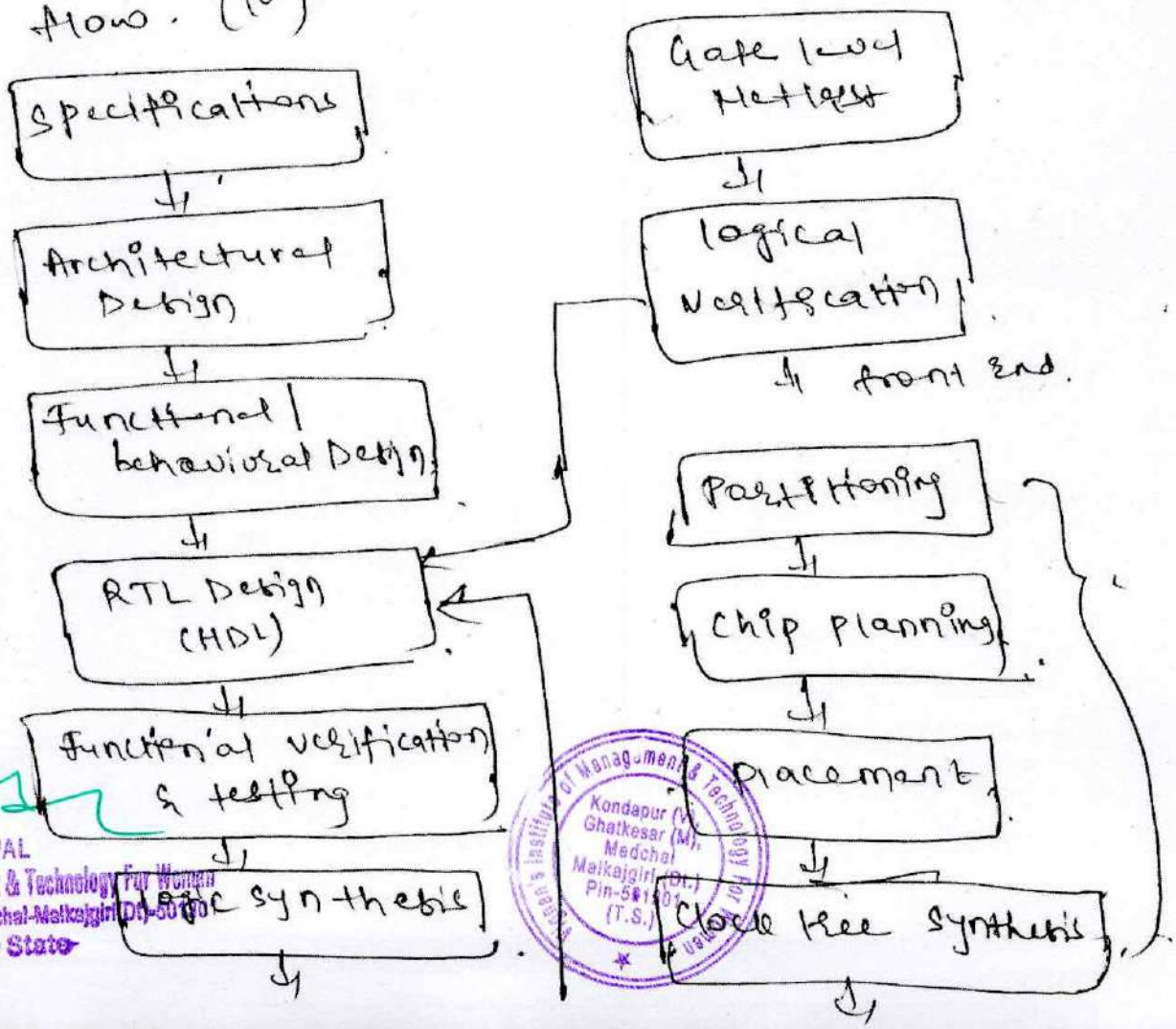
Step-10: Metallization

Then whole chip then has metal (Aluminium) deposited over its surface to a thickness typically 1μm. This metal layer is then masked and etched to form the required interconnection pattern.



(2) Explain the steps involved in VLSI design flow. (10)

Ans



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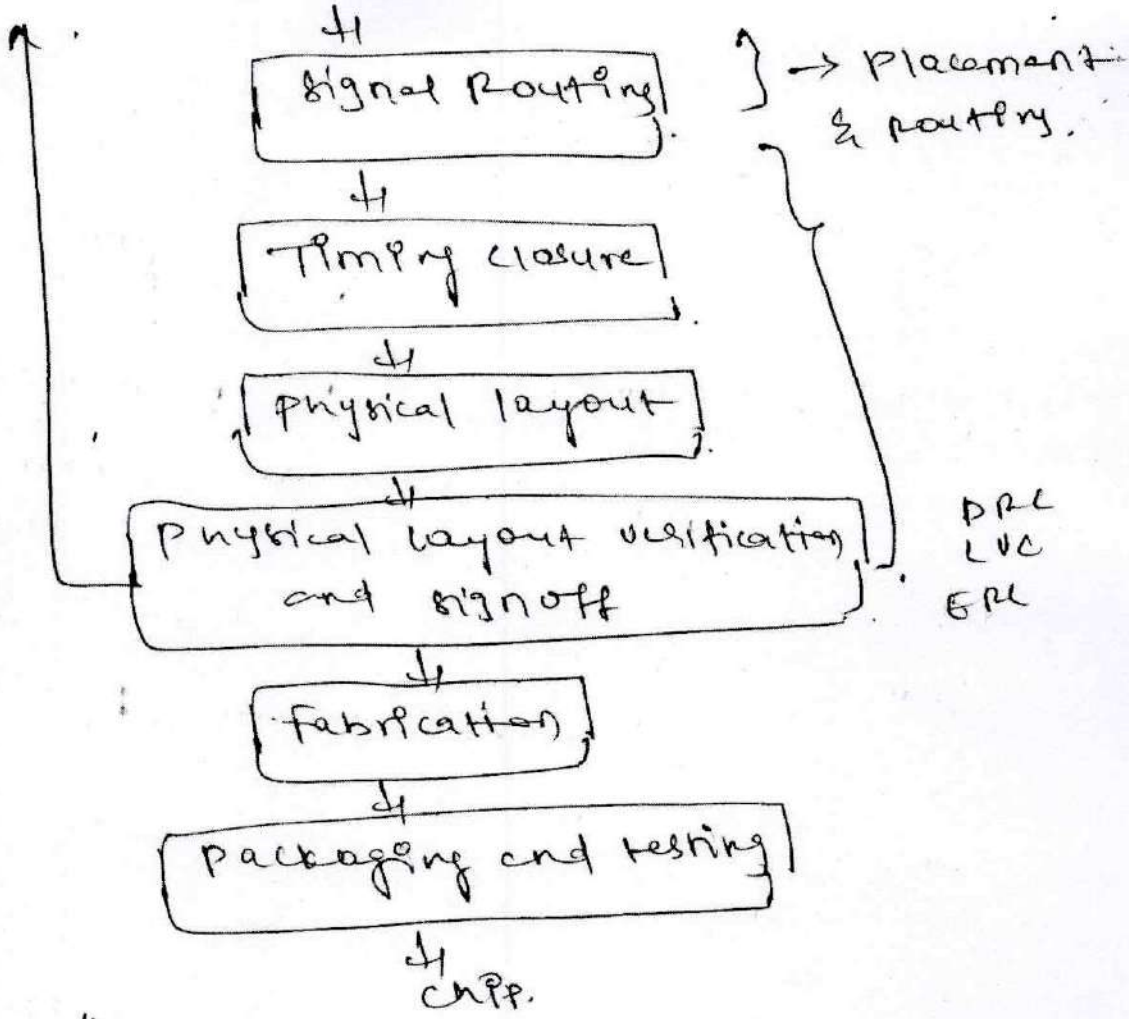

→ Specifications: Requirement of customer

→ Architectural Design: Selecting Algorithms.

→ Functional (Behavioral design): What functions are required.

→ Partitioning: Design consists of many circuits, those circuits should be partitioned.

→ Chip planning: Organizing different chips circuits on silicon chip.

→ Placement: placing the circuits

→ Clock tree Synthesis: clock distribution system to various circuits

→ Signal Routing: Electrical interconnections b/w the circuits is done

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Timing closure: whether the given time is reached or not.

Design Rule checking: layout design rules are properly followed or not.

3) a) Distinguish between enhancement and Depletion mode transistor action in nMOS - 5M

Ans: Depletion MOSFET: It is a type of MOSFET where the channel is constructed during the process of manufacturing. Therefore D-MOSFET can conduct between its drain and gate when the $V_{GS} = 0$ volts. Therefore D-MOSFET is also known as normally ON transistor.

Enhancement MOSFET: It is a type of MOSFET where there is no channel, constructed during its fabrication but. it is induced in the substrate using the gate voltage. The E MOSFET does not conduct when there is no voltage i.e. $V_{GS} = 0V$. Therefore E-MOSFET is also known as normally OFF transistor. In case the V_{GS} or gate voltage is zero, there is no channel. Therefore there is no path for the conduction of current between its source and drain.

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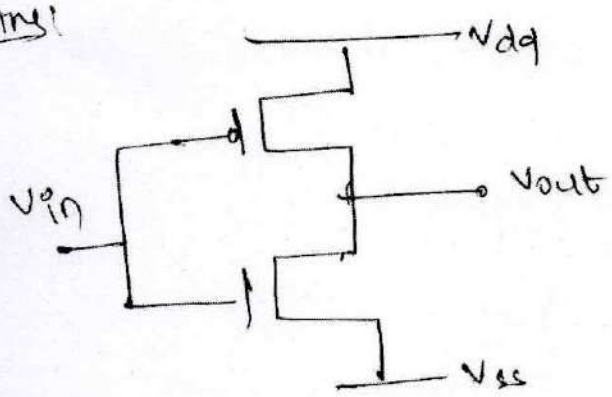
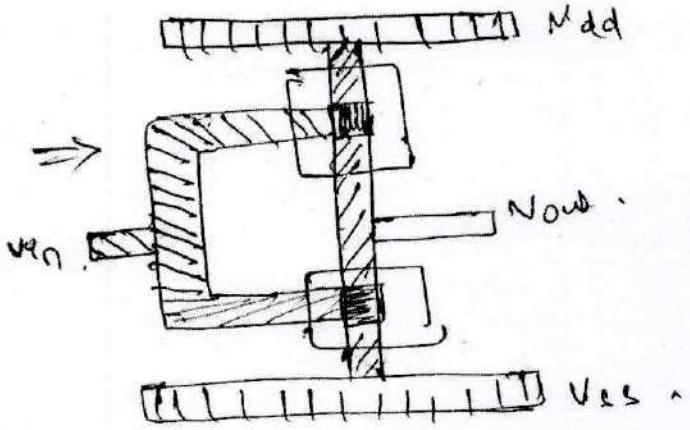
3b) Draw the neat layout diagram of the CMOS Inverter — 5M

Ans:

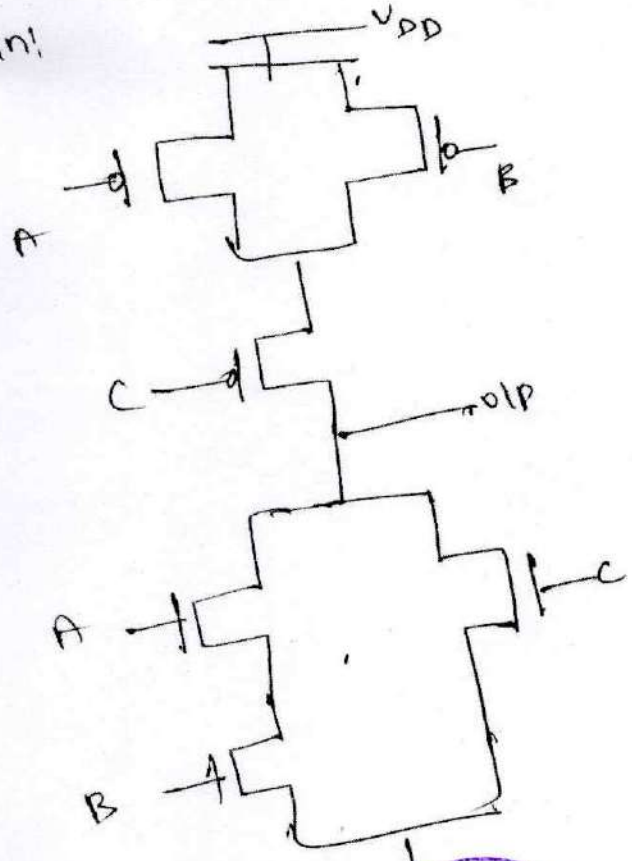


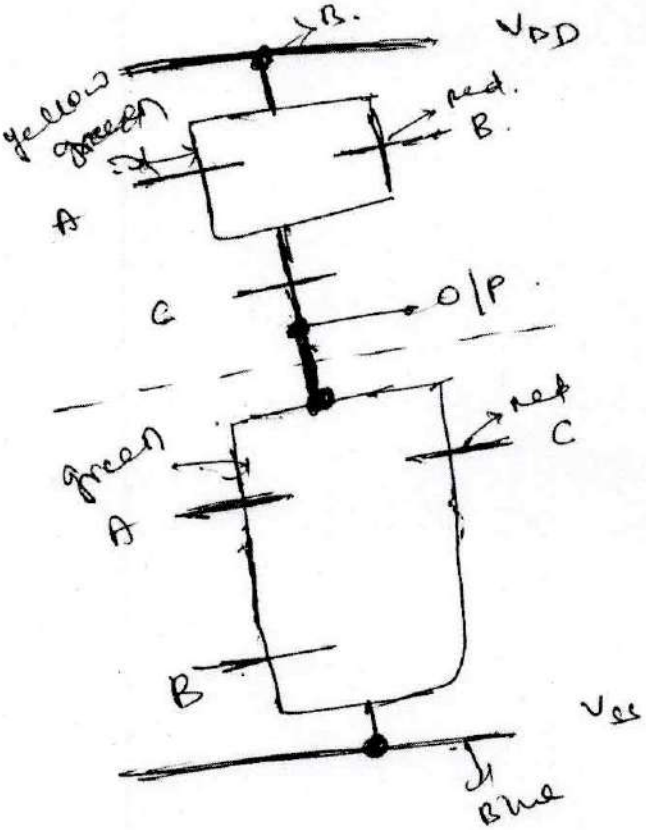


4) Draw the stick diagram for the following boolean expression using CMOS logic.

$f = \overline{A(B+C)}$ — 10M

Soln:





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Kondapur (V), Ghatkesar (M), Medchal - Malkajgiri (D) - 501 301. Phone: 96529 10002/3

CSE & ECE

III- B.Tech II Semester I-Mid Examinations, May-2022

Roll Number: 19U91A0412

Branch & Sections: III- ECE – A & B
Academic Year: 2021-22
Sub: **VLSI Design**

Time: 20mins
Max. Marks: 10
Date: 06.05.2022 (FN)

SET-2

Answer all Questions — **10 X 0.5 = 5**

Part-A

Multiple choice Questions

1	Switching speed of a MOS device depends on _____								[D]
	A	gate voltage above a threshold	B	carrier mobility	C	length channel	D	all of the mentioned	
2	Inverters are essential for _____								[D]
	A	NAND gates	B	NOR gates	C	sequential circuits	D	all of the mentioned	
3	CMOS inverter has _____ output impedance								[A]
	A	low	B	high	C	very high	D	none of the mentioned	
4	In linear region _____ channel exists								[A]
	A	uniform	B	non-uniform	C	wide	D	uniform and wide	
5	The oxide layer below the first metal layer is deposited using _____								[B]
	A	diffusion method	B	chemical vapour deposition	C	solid deposition	D	scattering method	
6	For constant voltage model,								[D]
	A	$\alpha = \beta$	B	$\alpha = 1$	C	$\alpha = 1/\beta$	D	$\beta = 1$	
7	Which gives scalable design rules?								[A]
	A	lambda rules	B	micron rules	C	layer rules	D	thickness rules	

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CSE & ECE

8	Which type of contact cuts are better?								[A]
	A	buried contacts	B	butted contacts	C	butted & buried contacts	D	none of the mentioned	
9	Features of switch logic approach								[D]
	A	occupies more area	B	no undesirable threshold voltage	C	low power dissipation	D	all of the mentioned	
10	The switch logic approach takes _____ static current								[C]
	A	low	B	more	C	no	D	very less	

Answer all Questions — **10 X 0.5 = 5**

Part-B

Fill in the Blanks

1	In nMOS inverter configuration depletion mode device is called as pullup
2.	What is the ratio of Zp.u/Zp.d for an NMOS inverter driven by another NMOS inverter 4/1
3.	The BJTs in the BICMOS circuit is in total configuration
4.	Guard rings prevent the formation of parasitic transistors and contact cuts
5.	Which color is used for implant? Yellow
6.	α is used for scaling Linear dimension
7.	What should be the spacing between two diffusion layers?
8.	Gate area is scaled by $\Delta g = L \times M$
9.	When the NMOS is turned ON in pseudo NMOS logic dynamic power is decreased
10.	In dynamic CMOS logic 4 clock is used

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Serial No: 22911

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Kondapur Vill., Ghatkesar Mandal, Medchal (Dist.) - 501301

B. Tech. Internal Examination Answer Booklet

Student Name	K. Nishitha			Date of Exam	06/5/22
Hall Ticket No.	190P1A0412	Branch	ECE	Year & Semester	III - II
Subject Name	VLSI			Mid	I

Signature of the Invigilator 6/5/22

Name & Signature of the Examiner Nishitha

Q. No.	1	2	3	4	Descriptive Total	Objective Total	Marks Obtained
a	10		5		19/20	8½	18
b			4		9½/10		20
Total	10		9				Maximum Marks

) NMos Fabrication :-

The steps involved in NMos Fabrication is

i) Substrate :-

protecting the poly silicon with higher impurities is grown on Crystal oxide.

→ In NMos, p type substrate is grown.

→ The thickness is 0.4um and is to 150mm diameter and doping Concentration of $10^{15} cm^3$ to $10^{16} Cm^3$ is formed.

p-substrate

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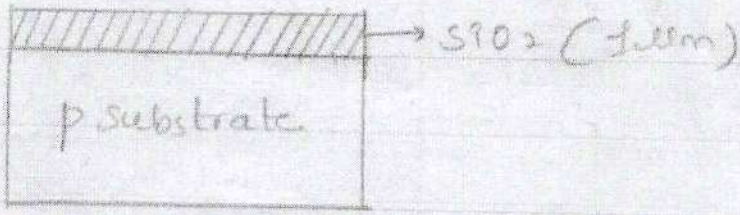
ii) Thick oxide:-

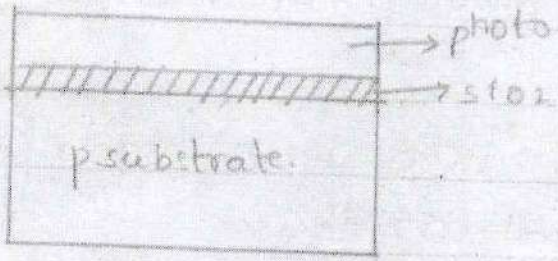
To cover and protect the p substrate a 1 µm silicon oxide is formed on top of the p substrate.



iii) photo resist :-

On top of pscubstrate and silicon oxide, a photo resist is formed.

→ We use a negative type photo resist.



iv) Exposing UV light :

photo resist we used is a negative type. so when we expose it, substrate gets harden. When we don't expose it to UV light, it gets soften. So we expose the substrate through masking

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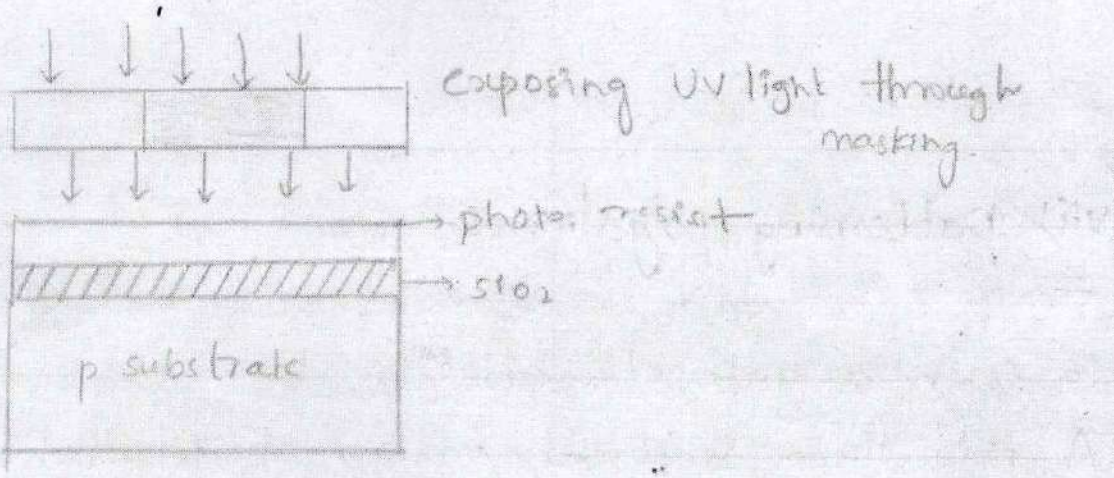
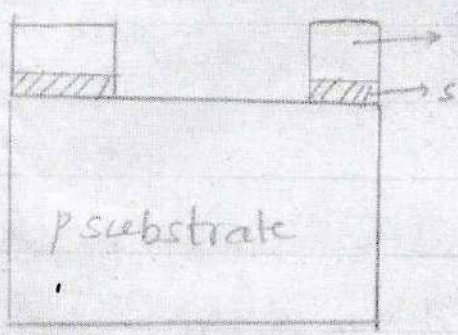


V) Etching the oxide layer :-

After exposing UV light to substrate window gets etched from masking.

The oxide layer etches and seperated.



Vi) Thin oxide

Photo resist is Completly removed from psubstrate and 0.1um of silicon dioxide is formed on top of p substrate to protect. By heating at a high temperature.

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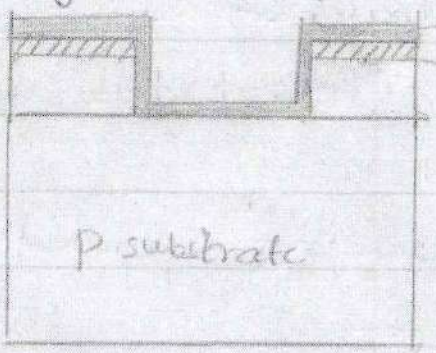
vii) Patterning polysilicon:-

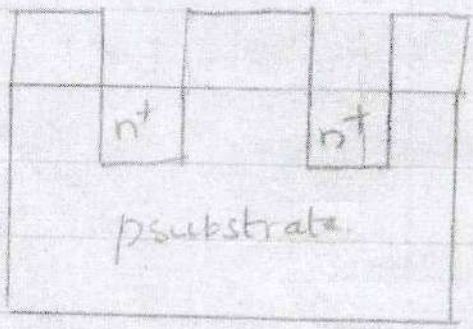
In p substrate, we have to Cover a polysilicon to form a gate structure on it.

A poly silicon is placed on top of p substrate to form a gate structure on it.



viii) N^+ diffussion:-

N^+ diffusion is formed on top of p substrate. The oxide layer is formed/~~on~~ diffused and form n^+ substrate by ~~etch~~ heating at a high temperature volume. n^+ substrate is formed on top of p substrate.



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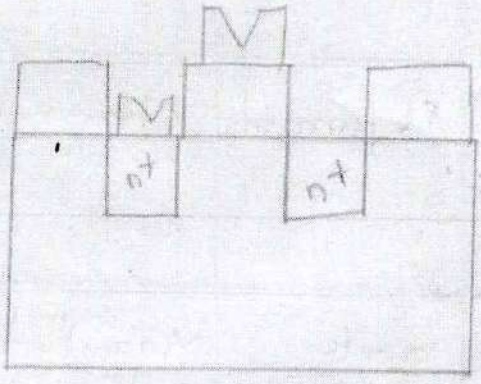
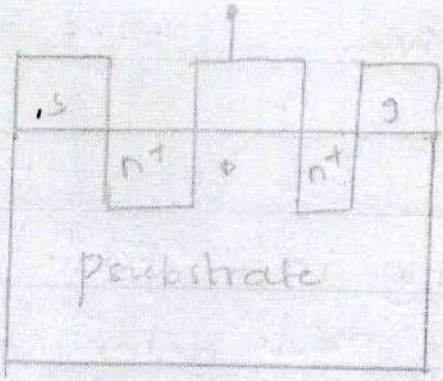
ix) Contact Cuts :-

In order to form source and drain and gate is known as Contact Cuts.

Source, drain and gate are formed by



x) Metallisation :-



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3(a) Enehancement and depletion mode transistor action in NMOS :-

Biasing	Enhancement mode	Extra depletion mode
i) Biasing	Foward bias	Reverse bias
ii) Channel formation.	No channel is formed	channel is formed.
iii) Effect on Current	Magnitude of gate bias increases the drain Current	Magnitude of gate bias decreases the drain current
iv) Threshold voltage	It is positive	It is negative
v) Operation	Operation only in Enhancement mode	Operated in both enhancement & depletion
vi) Flow of drain current	$V_{GS} > V_{TH}$	$V_{GS} = 0$

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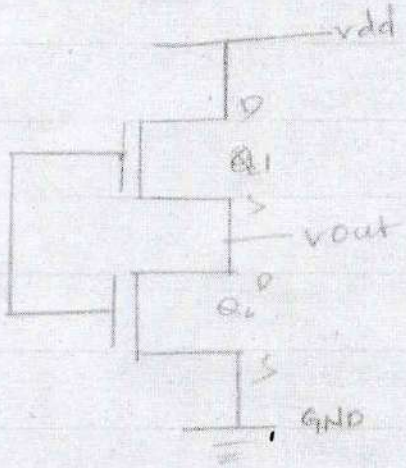
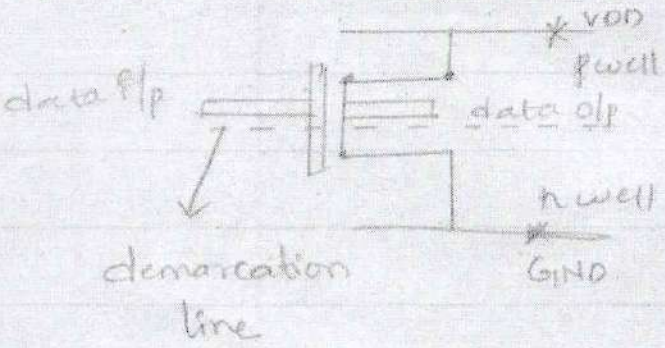
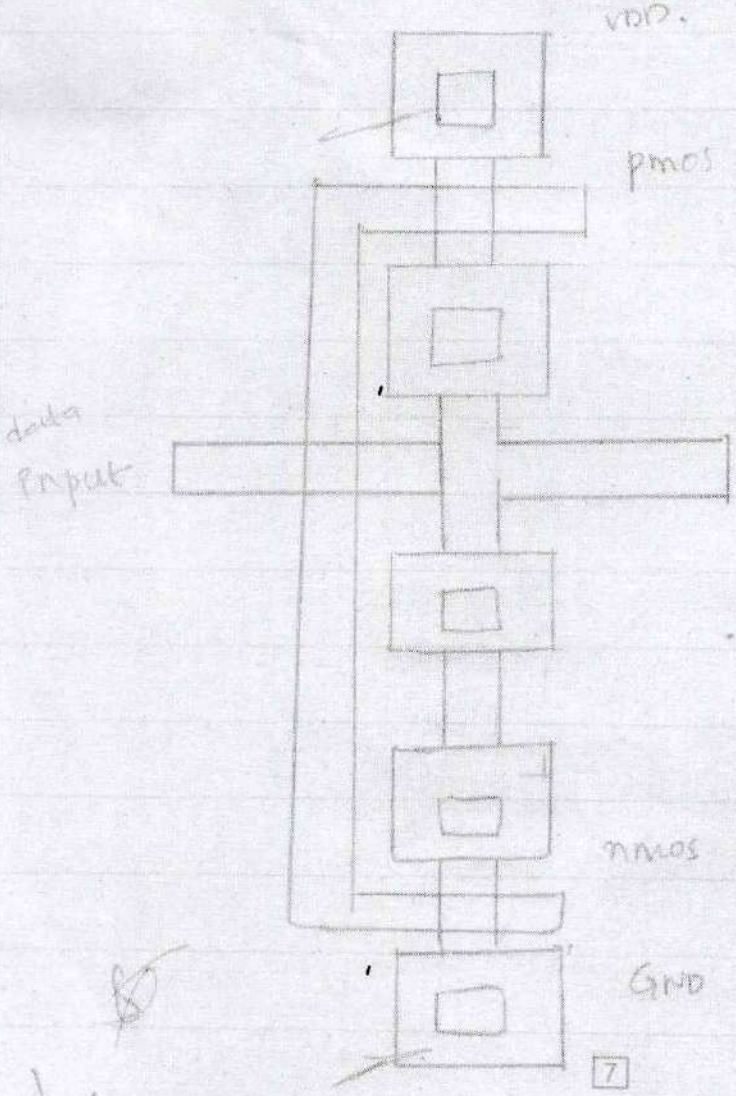
3b) Layout diagram of CMOS Inverter:-

Stick diagram:-





Layout diagram:-



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B.Tech - R18 - III Year - II Semester

COMPUTER SCIENCE AND ENGINEERING

Final University Consolidated Internal Marks Report-Date- 2022-08-08 16.05.09

CD ML STM

HNTO	15607	15618	15631	15632	15634	156AH	156AN	156BN	156CW	156DR
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19UP1A05C4	22	23	24	-	95	21	23	22	24	17
19UP1A05C5	23	20	24	-	94	22	23	23	23	16
19UP1A05C6	21	24	22	-	95	23	22	22	23	18
19UP1A05C7	22	22	21	-	95	22	23	21	23	20
19UP1A05C8	24	23	23	-	94	23	23	24	23	21
19UP1A05C9	22	21	23	-	95	20	21	19	23	18
19UP1A05D0	22	22	22	-	93	21	20	21	22	20
19UP1A05D1	21	21	22	-	93	20	22	23	24	24
19UP1A05D2	24	23	23	-	94	22	22	23	23	19
19UP1A05D4	21	23	21	-	93	22	23	22	22	20
19UP1A05D5	22	21	23	-	94	21	20	22	21	17
19UP1A05D6	19	20	22	-	93	19	19	22	23	19
19UP1A05D7	19	24	22	-	96	24	21	24	22	19
19UP1A05D8	20	22	23	-	93	23	23	21	24	23
19UP1A05D9	21	19	21	-	95	23	22	24	22	23
19UP1A05E0	24	22	24	-	95	22	24	25	24	23
19UP1A05E1	21	24	23	-	95	23	25	23	23	19
19UP1A05E2	23	22	22	-	94	22	22	24	24	20
19UP1A05E3	22	22	21	-	94	23	23	24	22	20
19UP1A05E4	20	21	24	-	95	23	23	24	24	21
19UP1A05E5	22	21	23	-	95	22	23	24	20	24
19UP1A05E6	21	19	24	-	94	24	24	25	24	25
19UP1A05E7	21	21	22	-	94	22	23	21	20	21
19UP1A05E8	20	20	23	-	94	20	22	21	20	19
19UP1A05E9	22	23	23	-	94	22	23	23	23	19
19UP1A05F0	19	22	22	-	95	18	16	20	19	20
19UP1A05F1	19	21	24	-	96	20	22	21	24	19
19UP1A05F2	23	20	23	-	95	22	22	24	23	23
19UP1A05F3	21	24	22	-	95	22	21	19	19	20
20UP5A0501	19	23	22	95	94	18	16	20	20	19
20UP5A0502	18	21	23	95	94	19	16	19	19	19
20UP5A0503	20	21	22	95	93	18	17	20	20	19
20UP5A0504	23	22	21	95	93	21	21	22	23	21
Total:157	3309	3418	3401	380	14838	3333	3334	3518	3485	3386

Note : '-1' indicates student is absent for the exam.

Subject Code	Subject Name
156AH	COMPILER DESIGN
15618	MACHINE LEARNING LAB
15607	COMPILER DESIGN LAB

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156AN	DESIGN AND ANALYSIS OF ALGORITHMS
156BN	MACHINE LEARNING
15634	CYBER SECURITY
15632	ENVIRONMENTAL SCIENCE
156DR	FUNDAMENTALS OF INTERNET OF THINGS
15631	SOFTWARE TESTING METHODOLOGIES LAB
156CW	SOFTWARE TESTING METHODOLOGIES

Signature Of Principal with Date & Office seal

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DEPARTMENT OF

ASSIGNMENT BOOK

Student Name : Ch. Kaveri Reddy

Year : II Semester : I

Roll No. : 160P1A0412

Course: B. Tech

Name of the Lab: Signals and Systems

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(Approved by AICTE, Affiliated to JNTU, Hyderabad)
Kondapur Village, Ghatkesar Mandal, Ranga Reddy District - 501 301
Phone : 08415 - 200006/07/08/09

Branch : CCC

Year : II

Semester : I

Roll No. : 20CPIAD412

STATEMENT OF ASSIGNMENT MAKRS

	Maximum Marks : 20							
	TA1	TA2	TA3	TA4	TA5	TA6	TA7	TA8
Date	8/12/22	9/2/2022						
Sig								
QN								
1	2½	5						
2	2½	5						
3	2½	5						
4	2½	5						
5	2½							
6	2½							
7	2½							
8	2½							
Totals	20	20						
Scale	5	5						

TA : Test or Assignment
Sig : Signature of the teacher for Assignment and Invigilator for test
QN : Question Number
Date : Assignment Submission / Exam Date
Scale : Totals Makrs are scaled down to 5

.....Space for Remarks by the faculty.....

Faculty Signature

Kaveri
Student Signature

Signature of HOD

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Assignment-I

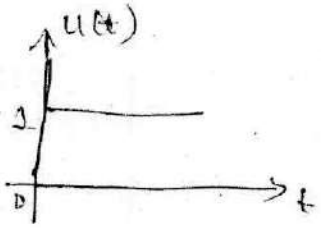
1)a:- Determine whether a unit step signal u(t) is Energy (or) Power signal.

Calculate Energy and Power of unit step signal u(t):-

Sol:-

unit step signal

$$u(t) = \begin{cases} 1 & t \geq 0 \\ 0 & t < 0 \end{cases}$$



1. Energy $\rightarrow \lim_{T\to\infty} \int_{-T}^{T} x^2(t)\,dt$

$$= \lim_{T\to\infty} \int_{0}^{\infty} 1^2\,dt \Rightarrow \lim_{T\to\infty} [t]_0^{\infty} = \infty$$

Here Energy is '∞'

It should be a finite value to be a unit step signal.

Hence, Energy signal is not a unit step signal.

2. Power $\rightarrow \lim_{T\to\infty} \frac{1}{2T} \int_{-T}^{T} x^2(t)\,dt$

$$\lim_{T\to\infty} \frac{1}{2T} [t]_0^T$$

$$\lim_{T\to\infty} \frac{1}{2T} [T-0]$$

$$\lim_{T\to\infty} \frac{T}{2T} = \frac{1}{2} = 0.5 \text{ W}.$$

$\therefore$ 0.5 is a finite value, so unit step signal is the Power signal.

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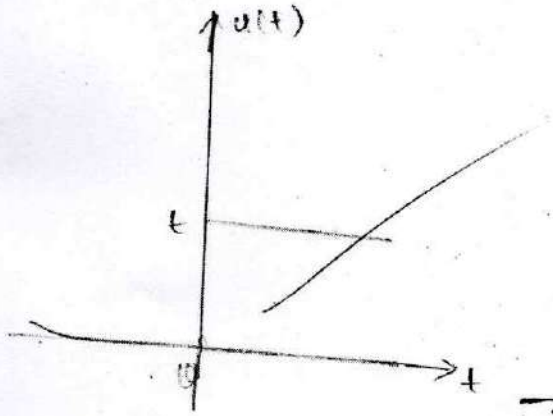
2)Q:- Sketch the unit step function and signum function bring the relation between them.

Sol:- → unit step function:- unit step function is a discontinuous step function which has an amplitude of 1 and 0 for positive and negative arguments of independent variable (t) respectively. It is denoted by u(t) and mathematically Represented as;

$$u(t) = \begin{cases} 1 & \text{for } t \geq 0 \\ 0 & \text{for } t < 0. \end{cases}$$



→ unit step function.

→ Signum function:- Signum function is an odd function having an amplitude of 1 and -1 for positive and negative value of independent variable (t) respectively. It is denoted by sgn(t) and it is mathematically Represented as;

$$Sgn(t) = \begin{cases} 1 & \text{for } t > 0 \\ -1 & \text{for } t < 0. \end{cases}$$

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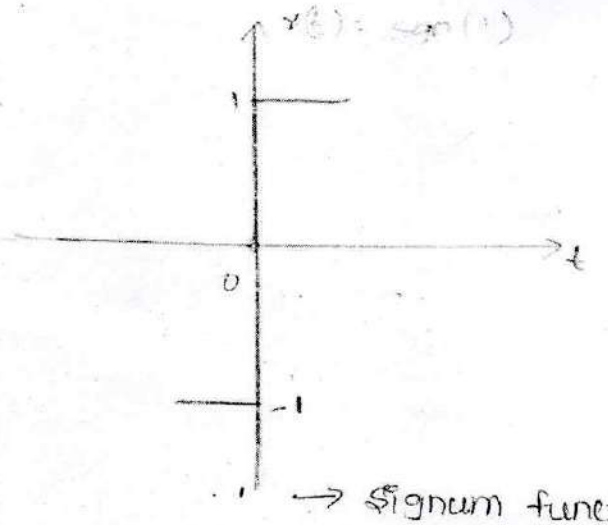
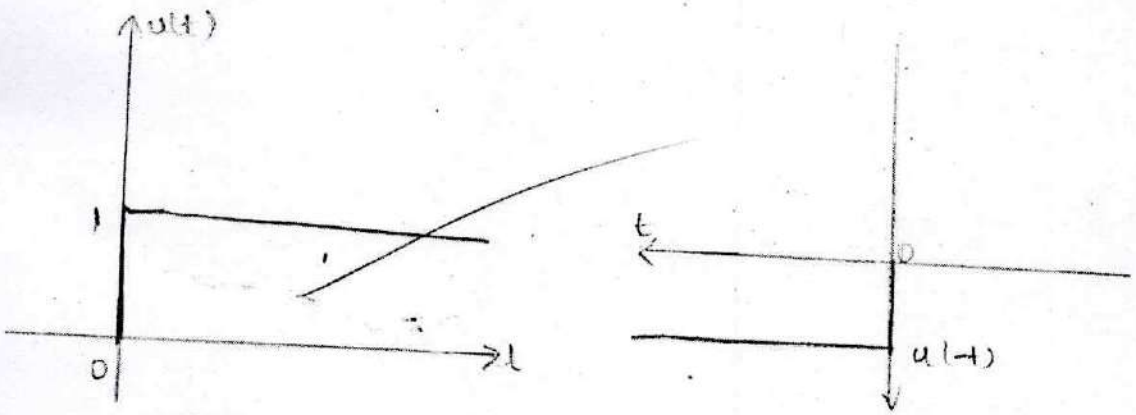
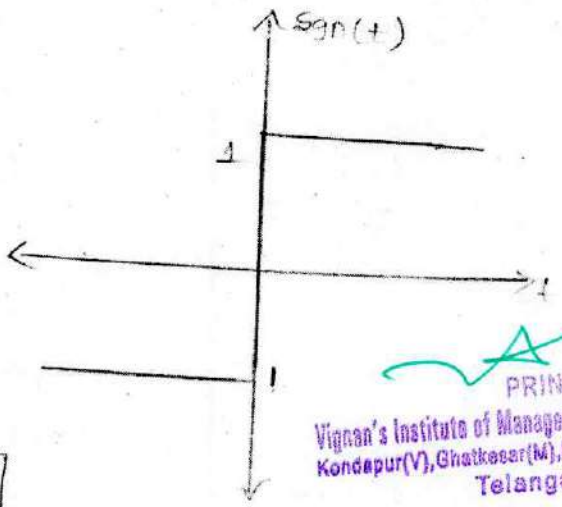


→ Signum function.

A Signum function is a weighted sum of unit step function and it reversal in both time and Amplitude. The diagrammatical relation is shown in figure



the relation between the unit step function and signum function.



$\therefore$ $\boxed{sgn(t) = u(t) - u(-t)}$

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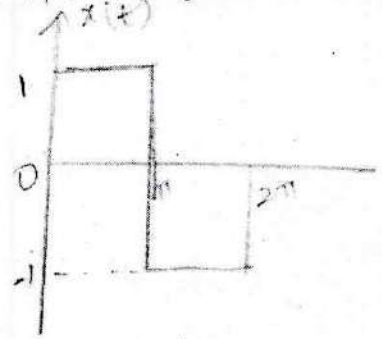
3. Derive an expression for computing mean square error in approximating a $f(t)$ by a set of 'n' orthogonal functions.

Sol:-

$$f(t) = \begin{cases} 1, & 0 < t < \pi \\ -1 & \pi < t < 2\pi \end{cases}$$ APP



→ As we know that

Sinnωt and Sinmωt are mutually orthogonal to each other within the interval $(t_0, t_0 + 2\pi/\omega_0)$

∴ The given function $f(t)$ is approximated as

$$f(t) \cong c_1 \sin t + c_2 \sin 2t + c_3 \sin 3t + \cdots c_n \sin nt \cdots \quad 0 < t < 2\pi$$

$$c_r = \frac{\int_0^{2\pi} f(t) \sin rt \, dt}{\int_0^{2\pi} \sin^2 rt \, dt}$$

$$c_r = \frac{\int_0^{\pi} \sin rt \, dt + \int_{\pi}^{2\pi} \sin rt \, dt}{\frac{1}{2}\left[\int_0^{\pi} (1 - \cos 2rt) \, dt\right]}$$

$$c_r = \frac{\frac{1}{r}\left[\cos rt\right]_0^{\pi} + \frac{1}{r}\left[\cos rt\right]_{\pi}^{2\pi}}{\frac{1}{2}\left[\left[t\right]_0^{2\pi} + 0\right]}$$

$$c_r = -\frac{1}{r}(\cos \pi r - 1) + \frac{1}{r}\left[1 - \cos \pi r\right]$$

$$c_r = \frac{2}{r\pi}(1 - \cos \pi r)$$

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If γ is even $C_\gamma = 0$; for $\gamma = 2, 4, 6, \ldots$

if γ is odd $C_\gamma = \frac{4}{\gamma\pi}$; for $\gamma = 1, 3, 5, \ldots$

Case (i):-

$$f(t) \simeq \frac{4}{\pi} \sin t \; ; \; 0 < t < 2\pi$$

$$\varepsilon = \frac{1}{t_2 - t_1} \left[\int_{t_1}^{t_2} f^2(t)\,dt - \sum_{\gamma=1}^{n} C_\gamma^2 K_\gamma^2 \right]$$

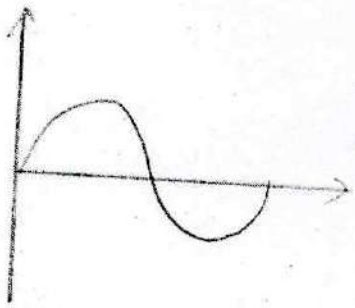
$$\int_{t_1}^{t_2} f^2(t)\,dt = \int_{\gamma}^{\pi} 1^2\,dt + \int_{\pi}^{2\pi} (-1)^2\,dt = 2\pi$$

Case(i): $f(t) \simeq \frac{4}{\pi} \sin t \; ; \; 0 < t < 2\pi$

$$\varepsilon = \frac{1}{2\pi} \left[2\pi - C_1^2 K_1 \right]$$

$$\varepsilon = \frac{1}{2\pi} \left[2\pi - \left(\frac{4}{\pi}\right)^2 \pi \right]$$

$$\boxed{\varepsilon = 0.18}$$



Case(ii) $f(t) \simeq \frac{4}{\pi} \sin t + \frac{4}{3\pi} \sin 3t \; ; \; 0 < t < 2\pi$

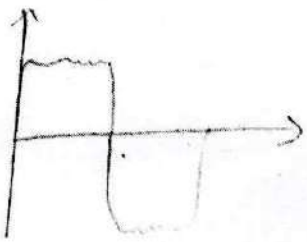
$$\varepsilon = \frac{1}{2\pi} \left[2\pi - \left(C_1^2 K_1^2 + C_3^2 K_3 \right) \right]$$

$$\varepsilon = \frac{1}{2\pi} \left[2\pi - \left(\frac{16}{\pi^2} \times \pi + \frac{16}{9\pi^2} \times \pi \right) \right]$$

$$\boxed{\varepsilon \simeq 0.99}$$

Case(iii) $f(t) \simeq \frac{4}{\pi} \sin t + \frac{4}{3\pi} \sin 3t + \frac{4}{5\pi} \sin 5t$

$$\boxed{\varepsilon \simeq 0.066}$$



γ is completely closed set of orthogonal to the for $\gamma = 0$.

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4. Discuss orthogonality in complex functions:-

Sol:- Let us consider two complex functions $f_1(t)$ and $f_2(t)$ in the interval of $t_1 < t < t_2$

The function $f_1(t)$ can be approximated using $f_2(t)$

$$f_1(t) \simeq c_{12} f_1(t) \quad \text{---} (1)$$

The value of c_{12} for min mean square error in this is

$$c_{12} = \frac{\int_{t_1}^{t_2} f_1(t) f_2^*(t) dt}{\int_{t_1}^{t_2} f_2(t)^* f_2(t) dt} \Bigg\} \rightarrow (2)$$

If $c_{12} = 0$ $\int_{t_1}^{t_2} f_1(t) \cdot f_2^*(t) dt = 0$.

This represents the condition for orthogonality (or) orthogonality.

Let us consider in n orthogonal functions $g_1(t), g_2(t), \ldots g_n(t)$ with in the interval $t_1 < t < t_2$.

$$f(t) \simeq c_1 g_1(t) + c_2 g_2(t) + \ldots c_r g_r(t) + \ldots c_n g_n(t)$$

$$c_r = \frac{\int_{t_1}^{t_2} f(t) g_1^*(t) dt}{\int_{t_1}^{t_2} g_r(t) g_r^*(t) dt}$$

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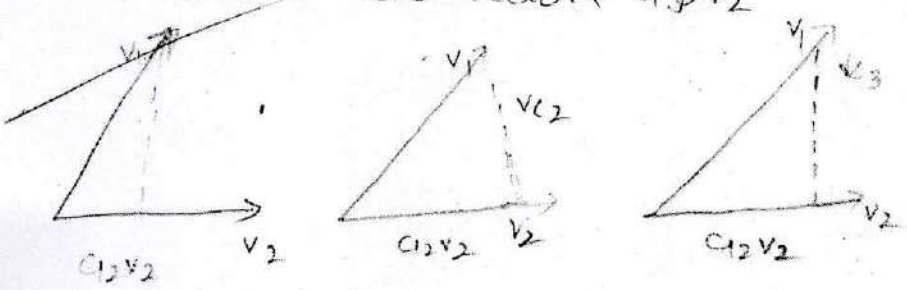
5. Derive the expression for component vector of approximating the function $f_1(t)$ over $f_2(t)$ and also prove that the component vector becomes zero if the $f_1(t)$ and $f_2(t)$ are orthogonal.

Sol:

→ Analogy between vectors & signals.

A physical phenomena with consists of both magnitude & direction is defined as vector.

Let us consider two vectors v_1 & v_2



$v_1 \cong c_2 v_2$

$v_1 = c_2 v_2 + ve$ — (1)

$v_1 \cdot v_2 = v_1 v_2 \cos\theta$

$\frac{v_1 v_2}{v_2} = v_1 \cos\theta$

$\frac{v_1 v_2}{v_2} = c_2 v_2$

$$\boxed{c_2 = \frac{v_1 \cdot v_2}{v_2^2}}$$

$\cos\theta = \frac{c_2 v_2}{v_1}$

$c_2 v_2 = v_1 \cos\theta$ — (2).

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Let signals $f_1(t)$ & $f_2(t)$ with in the interval $t_1 < t < t_2$

$f_1(t) \cong c_{12} f_2(t)$.

$f_1(t) = c_{12} f_2(t) + x_e(t)$

$x_e(t)$ = Error signal

$x_e(t) = f_1(t) - c_{12} f_2(t)$ ($\because$ mean square Error value).

$$\varepsilon = \frac{1}{t_2 - t_1} \int_{t_1}^{t_2} x_e^2(t)\, dt = \frac{1}{t_2 - t_1} \int_{t_1}^{t_2} \left[(f_1(t) - c_{12} f_2(t)) \right]^2 dt$$

$$\varepsilon = \frac{1}{t_2 - t_1} \int_{t_1}^{t_2} \left[f_1^2(t) - c_{12}^2 f_2^2(t) - 2 c_{12} f_1(t) f_2(t) \right] dt$$

$$\frac{d\varepsilon}{dc_{12}} = 0.$$

$$0 = \frac{1}{t_2 - t_1} = \int_{t}^{t_2} \frac{d}{dc_{12}} \left[f_1^2(t) + c_{12}^2 f_2^2(t) - 2 c_{12} f_1(t) f_2(t) \right] dt$$

$$0 = \int_{t_1}^{t_2} \left[0 + 2 c_{12} f_1^2(t) - 2 f_1(t) f_2(t) \right] dt$$

$$= 2 c_{12} \int_{t_1}^{t_2} f_2^2(t)\, dt - 2 \int_{t_1}^{t_2} f_1(t) f_2(t)\, dt$$

$$c_{12} = \frac{\int_{t_1}^{t_2} f_1(t) f_2(t)\, dt}{\int_{t_1}^{t_2} f_2^2(t)\, dt}$$

$c_{12} = 0$.

v_1 & v_2 are orthogonal to each other.

$$0 = c_{12} \int_{t_1}^{t_2} f_1(t) \cdot f_2(t)\, dt$$

$$\frac{\int_{t_1}^{t_2} f_1(t) \cdot f_2(t)\, dt}{\int_{t_1}^{t_2} f_2^2(t)\, dt}$$

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$$C_{12} = \int_{t_1}^{t_2} f_1(t) \cdot f_2(t)\,dt$$

$f_1(t)$ & $f_2(t)$ are orthogonal to each other over the interval $(t_1 \text{ to } t_2)$.

(6) Q:- Prove any two properties of impulse function:-

Sol:- It is a even function of t such that $\delta(t) = \delta(-t)$

$$\int_{-\infty}^{\infty} x(t)\,\delta(t)\,dt = x(0)$$

$$\delta(at) = \frac{1}{|a|}\,\delta(t)$$

$$x(t)\,\delta(t-t_0)\,dt = x(t_0)$$

$$x(1)\,\delta(t) = x(0)\,\delta(t) = x(0)$$

$$x(t) = \int_{-\infty}^{\infty} x(\tau)\cdot\delta(t-\tau)\,d\tau$$

1. $\delta(at) = \frac{1}{|a|}\delta(t)$

Case i)

$$\delta(at) = \frac{1}{|a|}\,\delta(t)$$

$$\int_{-\infty}^{\infty} x(t)\,\delta(at)\,dt$$

$at = u$

$dt = \frac{1}{a}\,du$

$$\frac{1}{a}\int_{-\infty}^{\infty} x(u/a)\,\delta(u)\,du = \frac{1}{a}\,x(0)$$

$$\int_{-\infty}^{\infty} x(t)\,\delta(at)\,dt = \frac{1}{a}(x0) \quad -(1)$$

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Case(ii) let $a < 0$

$$\int_{-\infty}^{\infty} x(t)\,\delta(-at)\,dt$$

$at = u$

$t = -\frac{1}{a}u$

$dt = -\frac{1}{a}du$

$u = -at$,

$$-\frac{1}{a}\int_{-\infty}^{\infty} x\left(-\frac{u}{a}\right)\delta(u)\,du$$

$$\frac{1}{a}\int_{-\infty}^{\infty} x\left(-\frac{u}{a}\right)\delta(u)\,du = \frac{1}{a}x(0) \quad -(2)$$

from Eqn ① & ②

$$\int_{-\infty}^{\infty} x(t)\,\delta(at)\,dt = \frac{1}{|a|}x(0)$$

$$= \frac{1}{|a|}\cdot\int_{-\infty}^{\infty} x(t)\,\delta(t)\,dt$$

$$\int_{-\infty}^{\infty} x(t)\,\delta(at)\,dt = \int_{-\infty}^{\infty} x(t)\left\{\frac{1}{|a|}\delta(t)\right\}dt$$

$$\boxed{\delta(at) = \frac{1}{|a|}\delta(t)}$$

iii) Solve $\int_{-\infty}^{\infty} \delta(at-b)\,dt$

$$\int_{-\infty}^{\infty} \delta\left(a\left[t-\frac{b}{a}\right]\right)dt$$

$$\int_{-\infty}^{\infty} \frac{1}{|a|}\delta\left(t-\frac{b}{a}\right)dt$$

$$\frac{1}{|a|}\int_{-\infty}^{\infty} \delta\left(t-\frac{b}{a}\right)dt = \frac{1}{|a|}.$$

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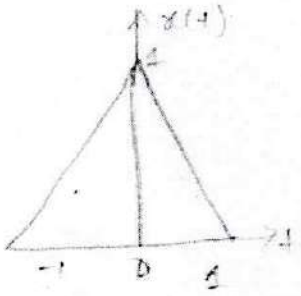
7Q.- If $x(t) = \begin{cases} 1-|t|; & -1 \le t < 1 \\ 0 & \text{otherwise} \end{cases}$: then sketch the signal $x\left(\frac{-t+1}{2}\right) + x\left(\frac{-t-1}{2}\right)$

Sol: Given signal, $x(t) = \begin{cases} 1-|t|; & -1 \le t \le 1 \\ 0 & ; \text{otherwise} \end{cases}$ — ①



We have to sketch $x\left(\frac{-t+1}{2}\right) + x\left(\frac{-t-1}{2}\right)$

i) $x\left(\frac{-t+1}{2}\right) \Rightarrow x\left(-\frac{t}{2} + \frac{1}{2}\right)$

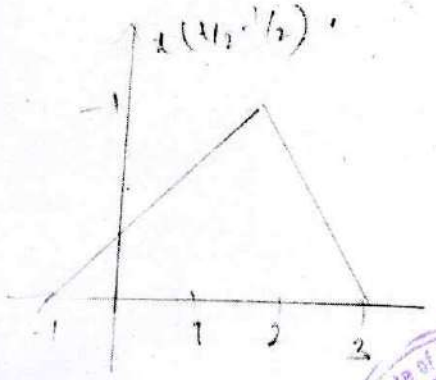
$x\left(-\frac{t}{2}+\frac{1}{2}\right)$ is $x(t)$ time shifted by $T = -\frac{1}{2}$ and expanded in time by a factor of 2 and time reversed (-ve sign) the exp for $x\left(\frac{-t+1}{2}\right)$ is obtained by substituting.

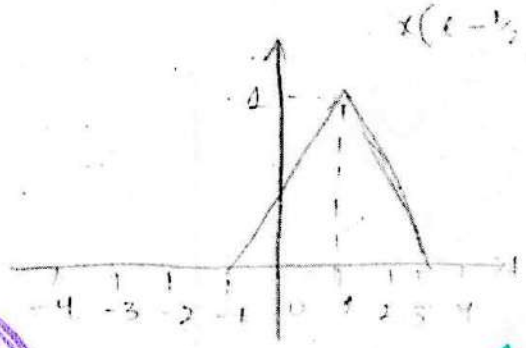
$t = \left(\frac{-t+1}{2}\right)$ in eqn ①

$$x\left(\frac{-t+1}{2}\right) = \begin{cases} 1 - \left|\frac{-t+1}{2}\right| & \text{for } -1 \le \frac{1}{2} + \frac{1}{2} \le 1 \\ 0 & \text{for otherwise.} \end{cases}$$

$$x\left(\frac{-t+1}{2}\right) = \begin{cases} 1 - \left|\frac{-t+1}{2}\right| & \text{for } -1.5 \le -\frac{1}{2} \le 0.5 \\ 0 & \text{for otherwise} \end{cases}$$

$x\left(\frac{-t+1}{2}\right)$ exists for $-1 \le t \le 3$ and sketch.





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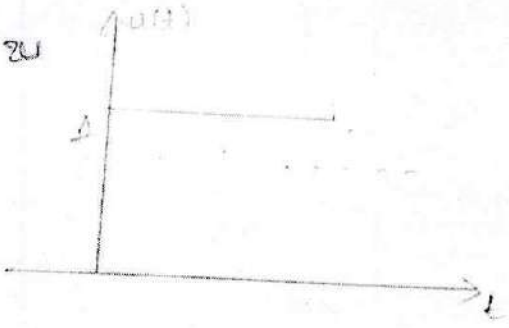
Q: Find an 'even and odd components of an unit step signal and also show that these components are orthogonal function.

Sol: The unit step $u(t)$ is defined as

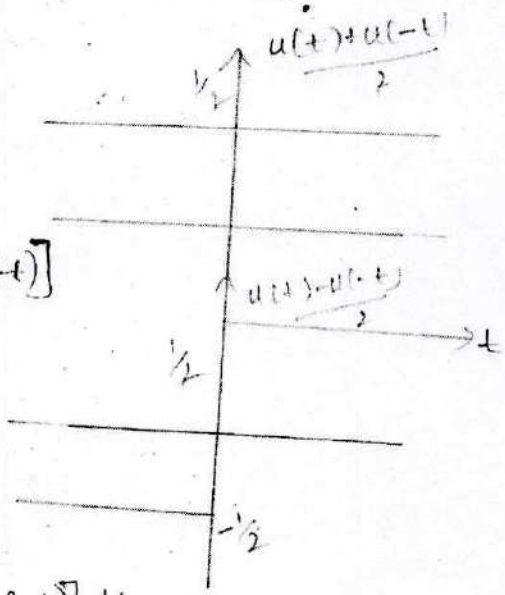
$$u(t) = \begin{cases} 1 & \text{for } t \geq 0 \\ 0 & \text{for } t < 0 \end{cases}$$



$$\int_{t_1}^{t_0} x_1(t) x_2(t)\, dt = 0 \quad \text{—①}$$

Here $x_1(t) = \frac{1}{2}[u(t) + u(-t)]$ and $x_2(t) = \frac{1}{2}[u(t) - u(-t)]$

let $t_1 = -t_0$ and $t_2 = t_0$



then Eqn① can be written as,

$$= \int_{-t_0}^{t_0} \frac{1}{2}\left[u(t) + u(-t)\right]\left[\frac{1}{2}u(t) - u(-t)\right]$$

let $t_1 = -t_0$ and $t_2 = t_0$

Then Eqn① can be written as,

$$= \int_{-t_0}^{t_0} \frac{1}{2}\left[u(t) + u(-t)\right]\left[\frac{1}{2}u(t) - u(-t)\right] dt$$

$$= \frac{1}{4}\left[\int_{-t_0}^{t_0} \left[u(t) + u(-t)\right]\left[u(t) - u(-t)\right] dt\right]$$

$$= \frac{1}{4}\left[\int_{-t_0}^{0} \left[u(t) + u(-t)\right]\left[u(t) - u(-t)\right] dt + \int_{0}^{t_0} \left[u(t) + u(-t)\right]\left[u(t) - u(-t)\right] dt\right]$$

Since $u(t) = 1$, $t \geq 0$ and 0 for $t < 0$

$u(-t) = 1$, $t \leq 0$ and 0 for $t > 0$, we get

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$$= \frac{1}{4}\left[\int_{-t_0}^{0}[0+1]dt + \int_{0}^{t_0}[1+0][1-0]dt\right]$$

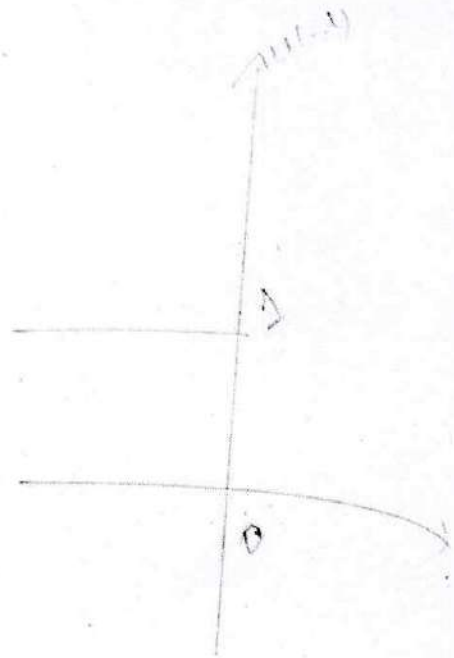
$$= \frac{1}{4}\left[\int_{-t_0}^{0} -1\,dt + \int_{0}^{t_0} dt\right]$$

$$= \frac{1}{4}\left[(-t)_{-t_0}^{0} + [t]_{0}^{t_0}\right]$$

$$= \frac{1}{4}\left\{-[0-(-t_0)] + [t_0-0]\right\}$$

$$= \frac{1}{4}\{-t_0 + t_0\}$$

$$= 0.$$



the Even and Odd Components of unit step signal satisfies the orthogonality condition hence, it is proved that these two components are orthogonal function.

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DEPARTMENT OF BASIC SCIENCE S & HUMANITIES

LABORATORY RECORD

Student Name : .....

Year : ..... Semester : .....

Roll No. : .....

Course: .....

Name of the Lab: .....

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(Approved by AICTE, Affiliated to JNTU, Hyderabad)

Kondapur Village, Ghatkesar Mandal, Ranga Reddy District - 501 301

Phone : 08415 - 200006/07/08/09

Principal

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Kondapur Village, Ghatkesar Mandal, Ranga Reddy District - 501 301.
Phone : 08415-200006 / 07 / 08 / 09

Certificate

Certified that this is the bonafide record of the work done by

(name) Mr./Ms. B.Tejasvini *of*

Year 2021 *Semester* 1 *Hall Ticket No.* 21UPIA1205

in Basic electrical engineering *Laboratory during the*

Year 2021 - 2022

Faculty In-Charge Lab | External Examiner | Head of the Departmen

Date : 09/05/22

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Exp. No.	Experiment	Page	Faculty	
			Sub. Date	Signature
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3.	Transient response of Series and RC circuits using DC excitation	8-11	04/02/22	
4.	Torque-Speed characteristic of a DC Shunt motor	12-15	18/02/22	
5.	Performance characteristic of DC Shunt motor	16-19	18/02/22	
6.	Load test on a Single phase transformer	20-22	18/02/22	
7.	Measurement of voltage, Current & real power in primary & Secondary circuit of Single phase.	23-25	18/02/22	
8.	Torque-Speed Characteristics of 3-ϕ Induction motor	26-28	31/3/22	
9.	Performance characteristic of 3-ϕ induction motor	29-31	31/3/22	
10.	Measurement of Reactive power for star and delta connected balanced load.	32-35	5/5/22	
11.	Measurent of Active power for star and delta connected balanced load	35-37	5/5/22	
12.	Calculation and Verification of impadence and current of RL, Rc, RLC Series circuit.	38-43	5/5/22	
13.	Series Resonance	43-45	5/5/22	
14.				
15.				

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Batch No.:

Roll No. : 21UP1A1205

EVALUATION SHEET

Regularity: A	Record Submission in-time: B	Viva-Voce: C	Experimentation: D

Exp. No.	Experiment Title	Date	A	B	C	D	Total	Faculty Sign
			2	3	4	6	T= [A+B+C+D]	
1.	Ohm's Law	17/12/21	2	3	4	5	14	
2.	Verification of Kirchoff's Current & Voltage laws	31/12/21	2	3	4	4	13	
3.	Transient response of Series and RC circuit using DC excitation	04/02/22	2	3	4	5	14	
4.	Performance characteristic of a DC-Shunt motor	18/02/22	2	3	4	5	14	
5.	Torque Speed characteristic of a DC shunt motor	18/02/22	2	3	4	6	15	
6.	Load test on a Single phase transformer	18/02/22	2	3	4	6	15	
7.	Measurement of V, I & real power in Primary & Secondary circuits in Single phase	18/02/22	2	3	4	6	15	
8.	Torque-Speed Characteristics of 3-ϕ induction motor	31/3/22	2	3	4	6	15	
9.	Performance characteristics of 3-ϕ induction motor	31/3/22	2	3	4	6	15	
10.	Measurement of Active power of star and delta connected balanced load.	5/5/22	2	3	4	5	14	
11.	Measurement of Active power for star and delta connected balanced load.	5/5/22	2	3	4	4	13	
12.	Calculation and verification of impedance and current of R_L, R, RLC Series circuit.	5/5/22	2	3	4	3	12	
13.	Series Resonance	5/5/22	2	3	4	2	11	
14.								
15.								
16.								
17.								
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21.								

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EVALUATION SHEET Contd.,

Exp. No.	Experiment Title	Date	A 2	B 3	C 4	D 6	Total T=[A+B+C+D]	Faculty Sign
22.								
23.								
24.								
25.								
26.								
27.								
28.								
29.								
30.								

Evaluation For MID-1: Day-Day Lab Evaluation (Maximum Marks): 15, Lab internal (Maximum Marks):10

Serial Nos. of Experiments conducted during MID-1

From Sl.No. (F1) 01 End Sl.No.(E1) 05 Total Lab Evaluation till Mid-1(ΣT) 85

Average Marks M1= [ΣT / (E1-F1+1)] 14.1

Internal Examination-I(N1) —

MID-1 Marks(M1+N1) 14

Final MID-1 Marks (in words) Fourteen

Evaluation For MID-2: Day-Day Lab Evaluation (Maximum Marks): 15, Lab internal (Maximum marks):10

Serial Nos. of Experiments during MID-2

From Sl.No. (F2) 7 End Sl.No.(E2) 13 Total Lab Evaluation till Mid-2(ΣT) 95

Average Marks M2 = [ΣT / (E2-F2+1)] 13.57

Internal Examination-2(N2) 9

MID-2 Marks (M2+N2) 24

Final MID-2 Marks (in words) Twenty four

Faculty-in-Charge: K Soni

Date: 09/01/22

Head of the Department:

Date:

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DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

IV B.TECH ECE - A **A.Y: 2021-2022** **Date: 05-04-2022**

IV YEAR PROJECT STAGE - II

S.No	Batch No	Roll Number	Student Name	Project Title	Review1 [25]	Review2 [25]	Review3 [25]	Final Marks
1	MJ18-A1	18UP1A0410	Gampala Madhuri	Contactless switch for Home Automation	23	24	25	24
2		18UP1A0412	Gandhe Akanksha		25	23	24	24
3		18UP1A0426	Kota Likhitha		24	25	23	24
4		18UP1A0427	Kotha Swathi		25	23	24	24
5	MJ18-A2	19UP5A0405	Boddireddy Ravali	Plant detection using yolo v2 deep learning algoritham	24	23	22	23
6		18UP1A0434	Aditi Sai		22	21	23	22
7		18UP1A0446	Shaik Zeenath		24	25	23	24
8	MJ18-A3	18UP1A0428	K. Sony	Low power and fast full adder by exploring new XOR and XNOR Gates	25	23	24	24
9		18UP1A0425	Konamutla Jhansi		24	23	22	23
10		18UP1A0408	Desham Srivani Reddy		23	22	21	22
11	MJ18-A4	18UP1A0443	Pulusani Varshitha	Real time AMR and control of household energy meter with GSM communication	19	18	17	18
12		19UP5A0403	B. Jhansi		22	20	21	21
13		18UP1A0430	Kunta Deepika		24	25	23	24
14	MJ18-A5	19UP5A0401	Abraboina Saikumari	A blind watermarking technique using redundant wavelet transform for copyright protection	21	21	21	21
15		18UP1A0452	Vuppugandla Sreeja		20	22	21	21
16		18UP1A0431	Ladalla Pavani		21	21	21	21

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17	MJ18-A6	19UP5A0404	Bathini Nivediti	Automatic colorization of black and white images using convolutional neural networks	17	18	19	18
18		18UP1A0419	Sharanya		21	20	19	20
19		18UP1A0447	S.Aishwarya		22	25	22	23
20	MJ18-A7	18UP1A0403	Vaishnavi Arroju	CCTV motion detection with Alaram using opencv on raspberry pi	21	20	22	21
21		18UP1A0424	Kancharla Sruthi		25	25	25	25
22		18UP1A0429	K. Akhila		25	25	25	25
23	MJ18-A8	18UP1A0435	Mitta Akshitha	ECG biometric authentication: A comparative analysis	24	25	23	24
24		18UP1A0405	B Sangeetha		21	25	23	23
25		18UP1A0423	K.Haripriya		25	25	25	25
26	MJ18-A9	18UP1A0445	Puja Reddy	Diabetic Diagnostic method based on Tongue image using various classifiers	17	20	20	19
27		18UP1A0432	Srividya		21	19	20	20
28		18UP1A0437	Motamarri Meghana		25	25	25	25
29		18UP1A0448	Sukka Sharanya		23	23	23	23
30	MJ18-A10	18UP1A0417	Guntupalli Midhuna	8-bit ALU Design using m-GDI technique	20	21	25	22
31		18UP1A0414	G Mounika		22	24	23	23
32		18UP1A0420	Janagama Srividhya		23	25	24	24
33	MJ18-A11	18UP1A0406	Chintakunta Rasagna	Lung cancer detection using Fuzzy clustering method &machine learning techniques	16	21	23	20
34		18UP1A0450	Tanguturi Niharika		20	18	22	20
35		18UP1A0422	Jonnalagadda Deepthi		19	21	20	20
36	MJ18-A12	18UP1A0421	Akshara Jogiraju	Fast GPS Signal Acquisation Implementation in MATLAB for SDR Approch	23	22	21	22
37		18UP1A0413	Kavya Ganna		19	18	20	19
38		18UP1A0402	Adusumilli Srilasya		25	25	25	25
39		18UP1A0404	Mounika Bandari		18	20	19	19
40	MJ18-A13	18UP1A0449	S.Amool Siri	Breast cancer prediction using Deep learning Technique	20	21	22	21
41		18UP1A0444	Jahnavi Reddy		21	23	22	22
42		18UP1A0407	Dammannapeta Soujanya		20	22	21	21
43		19UP5A0407	Gandhari Shailaja		19	24	23	22
44	MJ18-A14	18UP1A0433	Mounika	Design and implementation of high speed hybrid full adder by using 16nm	24	24	24	24
45		18UP1A0409	Digajarla Snehitha		23	24	25	24
46		19UP5A0402	Adepu Shivani		25	24	23	24

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47	MJ18-A15	18UP1A0453	Yelloju Sravani	Design and simulation of low power Wilson current mirrorand single supply CMOS level shifter	24	24	24	24
48		18UP1A0418	Gurugubelli Sushma		25	25	25	25
49		18UP1A0436	Kusuma		24	23	25	24
50	MJ18-A16	18UP1A0439	N Rupa Rani	Reversable data hiding methodology for secret communication based on ECG signal processing using MAT lab	21	22	23	22
51		18UP1A0451	Manasa Veeramalla		22	21	23	22
52		18UP1A0440	Shivani Reddy Nachu		21	23	22	22
53		18UP1A0442	Peddi Aishwarya		23	22	21	22
54	MJ18-A17	18UP1A0438	N.Gayathri	Self-repariable Multiplexer for fault tolerant systems	25	25	25	25
55		18UP1A0401	Addanki Dharani		25	25	25	25
56		18UP1A0415	Girineni Divya		25	25	25	25

Project Review Committee Members:

1.Dr.Vijaykumar R Urkude

2.Mr.J.Sunil Kumar

3.Mr.G.Ganesh Reddy

Project Co-Ordinator

HOD, ECE

Head of the Department
Electronics and Communication Engineering
Vignan's Institute of Management and Technology for Women
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DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

IV B.TECH ECE - B **A.Y: 2021-2022** **Date: 05-04-2022**

IV YEAR PROJECT STAGE - II

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Vignan's Institute of Management & Technology For Women Kondapur (V), Ghatkesar (M), Medchal Malkajgiri (Dt.) Pin-501301 (T.S.)

S.No	Batch No	Roll Number	Student Name	Project Title	Review1 [25]	Review2 [25]	Review3 [25]	Final Marks
1	MJ18-B1	18UP1A0481	M.Yoshitha	Validation of CMOS reversible logic gates of 16nm regime	23	24	25	24
2		18UP1A0484	Pesaru Shivani		24	25	23	24
3		18UP1A0480	M.Vasantha Laxmi		24	24	24	24
4		18UP1A0463	Chalasani.Sri Sai Bhuvaneswari		25	24	23	24
5	MJ18-B2	18UP1A0467	Gurram Sravanthi	Generic food identification using marker controlled segmentation algorithm	21	25	23	23
6		19UP5A0411	Nutenki Sindhu		24	23	25	24
7		19UP5A0413	S. Akhila		25	25	25	25
8		19UP5A0412	Keerthy		23	25	24	24
9	MJ18-B3	19UP5A0410	N.Shirisha	Design and simulation of multistage hybrid full adder using CMOS 16nm technology	22	24	23	23
10		18UP1A0499	Sudhagoni Sindhu		24	23	22	23
11		18UP1A0487	Pappula.Varshitha		24	23	25	24
12		17UP1A0492	S Sukeerthi		19	23	24	22
13	MJ18-B4	18UP1A04A0	Shruthimadhuri Tenkasala	Object sorting automated system using raspberry-pi	24	25	23	24
14		18UP1A04A3	Yerra Sushmitha		23	24	25	24
15		18UP1A04A2	Vuyyala Sreeja		24	25	23	24
16	MJ18-B5	18UP1A04A1	Satvika Veeramreddy	RF Controlled fire fighting robot with high pressure watersprinkler	23	24	25	24
17		18UP1A0488	Rashmitha Peddi		25	25	25	25
18		18UP1A0456	B.Soumya		25	23	24	24
19	MJ18-B6	18UP1A0469	Jakka Keerthi Reddy	IoT based Smart Garbage Monitoring System with solar cell	22	25	25	24
20		18UP1A0468	Jakka Deepthi Reddy		25	25	25	25
21		18UP1A0483	Poduri Meher Seshasree		21	24	24	23
22		18UP1A0473	Rupa Kodali		23	22	24	23
23	MJ18-B7	18UP1A0486	P.N.V.Vyshnavi	STS System: Sign to Speech and Text ,Speech to sign and text, and text to speech and sign converter	25	25	25	25
24	MJ18-B8	19UP5A0408	K Renuka	A three stage comparator and its modified version with high speed and low kickback	24	25	23	24
25		18UP1A0496	Santi Sreeja Reddy		25	25	25	25
26		18UP1A0459	B.Abhighna		25	25	25	25

27	MJ18-B9	19UP5A0414	Voruganti Akanksha	Design and validation of low power high speed hybrid logic 5-32 using 2-4 decoders line decoders	21	24	24	23
28		18UP1A0466	Lakshmi Prasanna Gummadeela		24	21	24	23
29		18UP1A0492	P.Anvitha		24	24	24	24
30	MJ18-B10	18UP1A0482	Nandyala Varshitha	Breast cancer prediction using machine learning algorithm	21	23	25	23
31		18UP1A0454	Arshia Jabeen		25	25	25	25
32		18UP1A0479	M. Apoorva		24	24	21	23
33	MJ18-B11	18UP1A0493	Pothuganti Madhunitha	Advance vehicle detection and auto penalty collection by using IOT	22	22	22	22
34		18UP1A0471	K.Pooja		17	19	24	20
35		18UP1A0458	Boddireddy Sai Ashritha		21	22	23	22
36	MJ18-B12	18UP1A0460	Boggula Venkata Krishna	Real time face recognition and door access control system	20	23	23	22
37		18UP1A0495	Prananjali Reddy		23	23	23	23
38		18UP1A0462	C.Kavya Sree		25	25	25	25
39	MJ18-B13	18UP1A0472	Divya Sri Sai Durga Kari	High Speed hybrid logic full adder using high performance 10-T-XOR-XNOR cell	25	25	25	25
40		18UP1A0498	Sravya Savirigam		20	24	25	23
41		18UP1A0477	Malkeyagaru Sathwika Reddy		21	23	22	22
42	MJ18-B14	18UP1A0476	Kurremula Sai Sowjannya	Face Mask Detection using Image Processing	20	21	22	21
43		18UP1A0464	C. Tejaswini		19	21	20	20
44		18UP1A0494	P. Sravani		22	22	25	23
45	MJ18-B15	18UP1A0490	Bhoomika	Automatic irrigation utility system	25	25	25	25
46		18UP1A0461	Borra Likitha		21	23	25	23
47		18UP1A0489	Pravalika Peddireddy		24	24	24	24
48	MJ18-B16	18UP1A0465	Gadusu Navya	Smart voting system using fingerprint recognition	22	25	25	24
49		19UP5A0409	Nimma Jhansi		23	25	24	24
50		18UP1A0475	Bhavana Koppula		25	25	25	25
51	MJ18-B17	18UP1A0457	Motupalli Bhavana Sai Priya	IoT based automatic solar grass cutter using scalable patterns	20	21	19	20
52		18UP1A0478	Shresta Mandala		19	22	22	21
53		18UP1A0455	A.Sindhuja		17	18	19	18
54		18UP1A0474	Kola Snigdha		22	22	25	23
55	MJ18-B18	18UP1A0497	Navya Sri Saranga	Localization of neoplasm information in brain tumor images using neural networks classification in medical images	22	25	22	23
56		18UP1A0491	Pochampalli Harini		23	22	24	23

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