

Sub Code: **BSM-152**

Roll No.

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B. Tech.

Year: I Semester: II

Test-I (Even Semester 2021-22)

Title of Subject: Ordinary and Partial Differential Equations

Time: 1 Hr.

Max Marks: 20

Note: Attempt ALL questions. ALL questions carry equal marks.

Q1. Attempt any Two parts of the following. Q. 1 (a) is compulsory.

a) ~~✗~~ Solve $(D^2 + 2D + 1)y = \frac{e^{-x}}{x^2}$.

~~✗~~ Solve $(D^2 + 6D + 9)y = 5^x - \log 2$.

b) ~~Solve~~ $\frac{x^2 d^2 y}{dx^2} - \frac{3x dy}{dx} + y = \frac{\sin(\log x) + 1}{x}$.

c) Solve $x^2 y'' - (x^2 + 2x)y' + (x + 2)y = x^3 e^x$.

Q2. Attempt any Two parts of the following. Q. 2 (a) is compulsory.

a) ~~i~~ Show that $\frac{d}{dx}(J_n^2 + J_{n+1}^2) = 2\left(\frac{n}{x}J_n^2 - \frac{n+1}{x}J_{n+1}^2\right)$.

~~ii~~ Show that $2nJ_n = x(J_{n-1} + J_{n+1})$.

~~Solve~~ $x^2 y'' + (x^2 + x)y' + (x - 9)y = 0$ in series.

c) ~~i~~ Show that $\int_{-1}^1 (1 - x^2) P'_m P'_n dx = \begin{cases} 0, & m \neq n \\ \frac{2n(n+1)}{2n+1}, & m = n \end{cases}$.

ii. State and prove Rodrigue's formula.

Marks	CO	BL	PO	PI Code
6	1	3	1	1.1.1
4	1	3	1	1.1.1
4	1	3	1	1.1.1
6	2	3	1	1.1.1
4	2	3	1	1.1.1
4	2	2/3	1	1.1.1

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Printed pages: 1

BHM-154

Roll No.

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B. Tech.

(SEM II) EVEN SEMESTER

TEST-1 (EXAMINATION) 2021-22

Human Values & Professional Ethics-1

Time: 1 Hr.

Max. Marks: 20

Note: Answer all questions

Q.1 Attempt any Two parts of the following. Q. 1(a) is compulsory.

(a) Write a brief note on the following: -

6

- (i) Major systems of classification of values; and
- (ii) Difference between values, morals, and ethics.

(b) List and explain 10 important human values.

4

(c) Do 'prosperity' and 'wealth' differ? What are the consequences of our incorrect understanding about happiness and prosperity?

4

Q.2 Attempt any Two parts of the following. Q. 2(a) is compulsory.

(a) List and explain the important feelings that need to be recognized and fulfilled to ensure mutual happiness in relationships?

6

(b) "Discrimination leads to acrimony in relationships." Comment.

4

(c) What is Environmental Ethics? Explain.?

4

B. Tech.
Year: I, Semester: II
Test-I (Examination): 2021-2022
FUNDAMENTALS OF COMMUNICATION SYSTEMS

Time: 1 Hr.

Max Marks: 10

Note: Attempt ALL questions. ALL questions carry equal marks.

Q1.	Attempt any Two parts of the following. Q. 1 (a) is compulsory	Marks	CO	BL	PO	PI Code
a)	Explain Amplitude Modulation with mathematical expressions & suitable diagram. A modulating signal $m(t) = 10\cos(2\pi \times 10^3 t)$ is amplitude modulated with a carrier signal $c(t) = 50\cos(2\pi \times 10^5 t)$. Find the modulation index, the carrier power, and the power required for transmitting AM wave.	3	CO1	1,2	1,3	1.3.1
b)	Discuss SSB-SC-AM & derive the expression for bandwidth and power for the wave. Also mention some its advantages disadvantage and its applications.	2	CO1	1,3	1,2	1.3.1
c)	Define modulation and its need. Classify modulation & differentiate between analog and digital modulation.	2	CO1	1,4	1	1.3.1
Q2.	Attempt any Two parts of the following. Q. 1 (a) is compulsory					
a)	Derive the expression for frequency modulated (FM) signal with suitable diagram. Consider an FM signal $s(t) = 10\cos(2\pi \times 10^6 t + 8\sin(4\pi \times 10^3 t))$ Determine i) Modulation index ii) maximum frequency deviation iii) power and iv) bandwidth.	3	CO2	1,5	1,3	1.3.1
b)	Discuss Narrowband & wideband frequency modulation. List the different generation method for WB frequency modulation.	2	CO3	1,2	2	1.3.1
c)	Derive the expression for maximum frequency deviation of phase modulated (PM) signal and maximum phase deviation of frequency modulated (FM) signal.	2	CO3	1,4	2	1.3.1

BL – Bloom's Taxonomy Levels (1- Remembering, 2- Understanding, 3 – Applying, 4 – Analysing, 5 – Evaluating, 6 - Creating)

CO – Course Outcomes

PO – Program Outcomes

PI Code – Performance Indicator Code

B. Tech

(SEM II) EVEN SEMESTER

Minor Test-1 (EXAMINATION) 2021-2022

Subject Name: Engineering Economics

Time: 1 Hr.

Max. Marks: 20

Note- Answer All the Questions

Q.1 Attempt any **two** parts of the following. Q.1 (a) is compulsory.

- a) What is the meaning of Economics? State the scope of managerial economics. 6
- b) Explain the decision making process of managerial economics. 4
- c) What are the uses of managerial economics with respect to engineering? 4

Q.2 Attempt any **two** parts of the following. Q.2 (a) is compulsory.

- a) What is Demand? Is it different from desire? Explain its types. 6
- b) Explain the determinants of demand. 4
- c) What is cross elasticity of demand? Explain with an example. 4

B. Tech.

Year: I Semester: II SEM

Test-I (Examination): 2022

BASICS OF PROGRAMMING SKILLS

Time: 1 Hr.

Max Marks: 10

Note: Attempt ALL questions. ALL questions carry equal marks.

Q1.	Attempt any Two parts of the following. Q. 1 (a) is compulsory.	Marks	CO	BL	PO	PI Code
a)	Draw neat block diagram of digital computer & Explain the function of each of the blocks.	3	CO5	L3	PO2	2.5.1
b)	Define flowchart and algorithm. Draw a flowchart and write an algorithm to find out the number is prime or not.	2	CO5	L2	PO2	2.6.1
c)	Write the difference between compiler and interpreter. Describe the function of a linker and loader.	2	CO5	L2	PO2	2.6.4
Q2.	Attempt any Two parts of the following. Q. 2 (a) is compulsory.					
a)	List the differences between while loop and do-while loop. Write a C program to find factorial of a number using for loop.	3	CO6	L2	PO2	2.5.2
b)	Implement a C program to find the reverse of an integer number and check whether it is palindrome or not.	2	CO6	L3	PO2	2.5.1
c)	What is type conversion? Explain two types of conversion with examples.	2	CO6	L3	PO2	2.6.1

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CO – Course Outcomes

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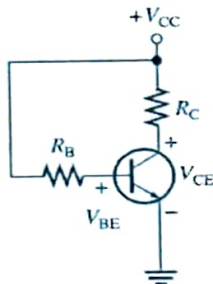
B. Tech.
Year: 1st Semester: 2nd
Minor Test-I Examination: 2021- 2022
Fundamentals of Electronics Engineering

Max Marks: 10

Time: 1 Hr.

Note: Attempt ALL questions. ALL questions carry equal marks.

Q1.	Attempt any Two parts of the following. Q. 1 (a) is compulsory.	Marks	CO	BL	PO	PI Code
a)	Explain depletion region and barrier potential in an unbiased p-n junction with the help proper diagram.	3	CO2	3,	1	1.3.1
b)	i. What are the three biasing conditions of the semiconductor diode? ii. Define is Load line Analysis using proper diagram.	2	CO1	2	2	1.3.1
c)	The primary to secondary turns ratio of a transformer used in a HWR is 20:1. If the primary is connected to the power mains: 220V, 50Hz, calculate D.C voltage across the 1K Ω load resistor. Also find the diode current.	2	CO1	3, 5	2	1.3.1
Q2.	Attempt any Two parts of the following. Q. 1 (a) is compulsory.					
a)	Define I_{CBO} and I_{CEO} . How are they different? How are they related? Are they typically close in magnitude?	3	CO3	1	2	1.3.1
b)	i. Given an α_{dc} of 0.998, determine I_C if I_E 4 mA. ii. Determine β_{dc} if I_C 2.8 mA and I_B 20 mA .	2	CO2	3, 5	2	1.3.1
c)	(a). Determine the Q-point values of I_C and V_{CE} for the circuit. Assume $V_{CE} = 8$ V, $R_B = 360$ k Ω and $R_C = 2$ k Ω . (b). Construct the dc load line and plot the Q-point.	2	CO1	2	1	1.3.1



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