

COLLEGE OF ENGINEERING
 SWAMI VIVEKANAND COLLEGE OF ENGINEERING PHYSICS
 BT201 (ENGINEERING PHYSICS)
 Semester (Apr 2025)

0822052111

AIM: 20

Attempt ANY FOUR questions. All questions carry equal marks.

Duration: 1.30 Hr

S.No.	CO	PO	Questions
1	CO1	PO1, PO3, PO7	State and prove Heisenberg's uncertainty principle. Unit I
2	CO1	PO1, PO7	What is wave function? Derive energy and momentum operators.
3	CO1	PO3, PO7,	Give the relation for group velocity and phase velocity.
4	CO4	PO1, PO2	Explain construction and working of He-Ne Laser. Unit IV
5	CO4	PO1, PO3, PO4, PO6	Explain propagation of light in an optical fiber. Derive the relation for numerical aperture and acceptance angle.
6	CO4	PO2, PO3, PO4, PO6	Calculate the numerical aperture and hence the acceptance angle for an optical fiber given that refractive indices of the core and the cladding are 1.45 and 1.40 respectively.

$$\Delta K_{ADC} = \pi$$

MST - II

SUBJECT CODE BT201 (Engg. Physics)
 BRANCH- CS1/CS2 -SEMESTER II (June- 2025)

$$\lambda = \frac{c^2}{Dn + P - \frac{P^2}{4PR}}$$

M.M : 20

Attempt any Four question out of 6 each question are carry equal 5 marks.

Duration: 1:30 Hr

No.	CO	PO	Questions	Marks
1	CO5	PO 2,4,5	Q.1 State and prove Gauss divergence theorem. Q.2 Find divergence and curl of following vector $F = 3xyz\mathbf{i} + 2yz\mathbf{j} + 3xyz\mathbf{k}$	5 5
2	CO5	PO 2,3,7	Q.3 Explain Michelson's interferometer in details along with the fringes formed by interferometer.	5
3	CO2	PO 1,3,4	Q.4 In newton's ring experiments the diameters of the n^{th} and $(n+1)^{th}$ dark rings are 4.2mm and 7.0 mm respectively. Radius of curvature of convex lens is 1m. Calculate wavelength of light. Q.5 Define Gradient of a scalar field.	5
4	CO2	PO 1,2,4	Q.6 What are Newton's ring? Derive the expression for finding the wavelength λ of monochromatic light.	5
5	CO5	PO 2,3,7		5
6	CO2	PO 1,2,4		5

Ans

SWAMI VIVEKANAND COLLEGE OF ENGINEERING
 SUBJECT CODE - B1-2021 (SUBJECT: Engineering Mathematics-II)
 BRANCH: - CS/IT/EX/ME/CE/SC, SECTION: SEMESTER - II (AUG-2025)
 MM: 20 Duration: 130 Hr

Attempt ANY FOUR questions. All questions carry equal marks.

S.No.	CO	PO	Questions	Marks
1.	CO-1	PO-1	Solve $(1 + y^2)dx = (\tan^{-1}y - x)dy$	5
2	CO-1	PO-1	Solve $\frac{dy}{dx} + y \tan x = y^2 \sec x$	5
3	CO-1	PO-1,2	Solve $x^2 \frac{d^2y}{dx^2} - 2x \frac{dy}{dx} - 4y = x^2 + 2 \log x$	5
4	CO-1	PO-2,1	Solve $(D^2 - 4D + 4)y = x^2 + e^x + \cos 2x$	5
5	CO-1	PO-1,2	Solve $(D^2 - 2D + 1)y = x \sin x$	5
6	CO-1	PO-2	Solve $\frac{dx}{dt} + y = \sin t$ $\frac{dy}{dt} + x = \cos t$	5

MST - II

SUBJECT CODE - BT-202 (Mathematics - II)
 BRANCH- CS/IT/CE/ME/EC/EX SEMESTER - II (MAY-JUNE- 2025)

M.M : 20

Duration: 1:30 Hr

Attempt any Four question out of 6 each question are carry equal 5 marks.

S.No.	CO	PO	Questions	Ma
1	CO2	PO1,2	Solve the following Differential Equation: $x \frac{d^2y}{dx^2} - (2x - 1) \frac{dy}{dx} + (x - 1)y = 0$	$\frac{d^2v}{dx^2} + IV = P/f(x)$ $I = 0 - \frac{1}{2} \frac{dP}{dx} - \frac{1}{4} P^2$ $y = u v$ $u = e^{-\frac{1}{2} \int P dx}$
2	CO2	PO1,2	Solve: $\frac{d^2y}{dx^2} - 2\tan x \frac{dy}{dx} + 5y = e^x \cdot \sec x$	Removal of 1st derivative
3	CO2	PO2,1	Find Series Solution: $x \frac{d^2y}{dx^2} + \frac{dy}{dx} + xy = 0$	$y = \sum_{n=0}^{\infty} a_n x^{n+1}$
4	CO2	PO1,2,3	Solve by the method of variation of parameter: $\frac{d^2y}{dx^2} + 4y = 4\tan 2x$	$W = \begin{vmatrix} u & v \\ u' & v' \end{vmatrix}$
5	CO3	PO1,2	Solve Partial Differential Equation: $x^2 p^2 + y^2 q^2 = z^2$	1st form: $z = ax + by + C$
6	CO3	PO2,1	Solve Partial Differential Equation: $z^2(p^2 z^2 + q^2) = 1$	2nd form: $x = x + ay$ $P = \frac{\partial z}{\partial x} \quad Q = \frac{\partial z}{\partial y}$

Roll No: 0822CS241109

SWAMI VIVEKANAND COLLEGE OF ENGINEERING
BT-203 (BME)
CS-2 SEMESTER I (APRIL- 2025)

Duration: 2Hr

MM: 20
Attempt ANY FOUR questions. All questions carry equal marks.

S. No	CO	PO	Questions
1	C01, C06	PO1,2,3,8,11	Define the following Mechanical Properties of material: a) Strength, b) Elasticity c) Plasticity d) Ductility e) Malleability, f) Toughness g) Creep, h) Fatigue i) Hardness j) Resilience
2	C01, C06	PO1,2,3,8,11	What is grey cast iron? State the composition of grey cast iron and its applications.
3	C01, C06	PO1,2,3,8,11	Draw and explain Stress-Strain diagram for a ductile material.
4	C05, C06	PO1,2,3,8,11	What is viscosity? Explain Newton's law of Viscosity.
5	C05 C06	PO1,2,3,8,11	Derive an expression for Bernoulli's equation.
6	C05, C06	PO1,2,3,8,11	Explain different type of pump.

SWAMI VIVEKANAND COLLEGE OF ENGINEERING, INDORE

MST -II

BT-203 (BME)

CS-2 - SEMESTER II (May - 2025)

Duration: 1:30 Hr

M.M : 20

Attempt any Four question out of 6, each question are carry equal 5 marks.

S.No.	CO	PO	Questions
1	CO3,CO6	PO1,2,3,11	Explain the working of 4-stroke Diesel engine with diagram.
2	CO5,CO5	PO1,2,3,11	Derive an expression for thermal efficiency of the Otto Cycle.
3	CO5,CO5	PO1,2,3,11	Differentiate between Petrol engine and Diesel Engine.
4	CO5,CO6	PO1,2,3,11	Define different types of fluid with examples.
5	CO3,CO6	PO1,2,3,11	Give the classification of Turbine. Explain any one in detail.
6	CO3,CO4	PO1,2,3,11	Explain Hydro Electric Power Plant.

0822CS241109

SWAMI VIVEKANAND COLLEGE OF ENGINEERING
MST I
BT-204 (BCEM)
CS -II-SEMESTER II (APRIL- 2025)

MM: 20

Attempt any Two question from 5 marks.

Attempt any Two question from 3 marks.

Question of 2 marks are compulsory.

Duration: 2Hr

S.No.	CO	PO	Questions	Marks
1	CO1	PO1, PO3	A) Write about physical and chemical properties of cement? B) What are the different tests performed on cement?	5
2	CO1	PO2, PO6	A) Give the classification of rocks. What are the characteristics of good building rocks? B) Explain water absorption test and acid test performed on stones.	5
3	CO1	PO3, PO4	A) Explain in detail the structure of timber with neat diagram. Also explain the seasoning of timber? B) Explain defects in timber?	5
4	CO1	PO1, PO5	A) What are the operations in the manufacturing of clay brick? B) Mention the standard & nominal dimension of Bricks as specified by	5
5	CO1	PO2, PO6	A) What is Lime? What are the different types of Lime? Explain any two tests on Lime? B) What is mortar? What are the different types of mortar? Explain any two in brief?	5
6	CO1	PO3, PO7	A) Explain the different elements of a building with neat sketch? B) Explain different types of foundation used in building construction with neat sketch?	5



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MST II

BT-204 (BCEM)

BRANCH –CS-II, SEMESTER-II (MAY - 2025)

Duration: 1:30 Hr

MM: 20

Attempt any Four question out of 6 each question are carry equal 5 marks.

S.No.	CO	PO	Questions	Marks															
1	CO 1	PO 3	Q.1 a) Write the types Plastering and pointing?	5															
	CO 1	PO 5	b) What do you understand by "Contour" and "Contour Interval"? Also give properties of contour lines?																
2	CO 2	PO 4	<p>Q.2 The following are the consecutive reading was taken with a leveling instrument at an interval of 20m.</p> <p>2.375, 1.730, 0.615, 3.450, 2.835, 2.070, 1.835, 0.985, 0.435, 1.630, 2.255 & 3.630m. The instrument was shifted after the 4th and 8th reading. The last reading was taken on a BM of RL 110.200m. Find the RL's of all the points by using Rise and Fall Method and also apply arithmetic check?</p>	5															
3	CO 3	PO 3	<p>Q.3 The following offset was taken from a line to an irregular boundary line at an interval of 10m. 0, 2.5, 3.5, 5, 4.6, 3.2, 0m Compute the area between chain line, the irregular boundary line and the end offset by</p> <ul style="list-style-type: none"> I. Mid-Ordinate Rule $d \times (h_1 + h_2 + h_{n-1})$ II. Average ordinate Rule $d \times (o_1 + o_2 + o_3 + o_n) / n$ III. The trapezoidal rule $\frac{d}{2} [(o_1 + o_n) + (o_2 + o_{n-1})]$ IV. Simpson's Rule 	5															
4	CO 3	PO 6	<p>Q.4 Define the following</p> <ol style="list-style-type: none"> 1. True bearing 2. Magnetic bearing 3. Fore sight 4. Back sight 5. Magnetic declination 	5															
5	CO 1	PO 8	<p>Q.5 The following bearings were observed while traversing</p> <table> <tr> <td>Line</td> <td>FB</td> <td>BB</td> </tr> <tr> <td>AB</td> <td>45°45'</td> <td>226°10'</td> </tr> <tr> <td>BC</td> <td>96°55'</td> <td>277°5'</td> </tr> <tr> <td>CD</td> <td>29°45'</td> <td>209°10'</td> </tr> <tr> <td>DE</td> <td>324°48'</td> <td>144°48'</td> </tr> </table> <p>Motioned the station affected by local attraction and determine the corrected bearings?</p>	Line	FB	BB	AB	45°45'	226°10'	BC	96°55'	277°5'	CD	29°45'	209°10'	DE	324°48'	144°48'	5
Line	FB	BB																	
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DE	324°48'	144°48'																	
6	CO 3	PO 4	Q.6 Define various building elements with the help of cross sectional diagram and explain Dog-legged stair case with neat sketch?	5															

082205 24/11/09

SWAMI VIVEKANAND COLLEGE OF ENGINEERING, INDORE
MST -I
SUBJECT CODE-BT 205(BCE)
BRANCH-CSE SEMESTER II (APRIL- 2025)

M.M : 20

Duration: 1:30 Hr

Attempt any Four question out of 6 each question are carry equal 5 marks.

S.No.	CO	PO	Questions	Marks
1	CO1	PO1	Define Computer Application in various fields.	5
2	CO1	PO1, PO3	Define Operating system? Write down its function and its types?	5
3	CO2	PO2, PO3	What is OOP? Write down its characteristics. How is it different with procedural oriented programming?	5
4	CO1	PO1, PO2	i) System Software vs Application software. ii) RAM vs ROM iii) MS word vs MS Excel	5
5	CO1	PO2, PO3	Discuss the classification of computer with example? What are the input device. Explain some popular input device.	5
6	CO2	PO2, PO3	Explain the organization of Computer with help of block diagram.	5

SWAMI VIVEKANAND COLLEGE OF ENGINEERING, INDORE
MST - II
SUBJECT CODE BT-205 (BCE)
BRANCH CS, SECTION CS-1,2,3
SEMESTER II (June- 2025)

M.M: 20

Attempt any Four question out of 6 each question is carry equal 5 marks.

Duration: 1:30 Hr

S.No.	Questions	Marks
1	Q.1 Explain friend function with suitable Example.	5
2	Q.2 Explain function overloading and operator overloading with suitable example? Why it is useful in C++.	5
3	Q.3 Explain expression with various type.	5
4	Q.4 What is Array? Explain different types of Arrays with Syntax and suitable example. <i>Collection of elements</i>	5
5	Q.5 Explain the difference between Class and Object.	5
6	Q.6 a) discuss the various sort of algorithm complexity such as time and space complexity as well as how they are quantified	5