

FACULTY OF ENGINEERING
B.E (Bridge Course) I Semester (Backlog) Examination,
March / April 2022
Subject: Engineering Physics

Time: 3 Hours

Max. Marks: 75

(Missing data, if any, may be suitably assumed)

PART – A

Note: Answer all questions.

(25 Marks)

1. Distinguish between Fraunhofer and Fresnel diffraction.
2. Explain the importance of diffraction grating
3. Explain the principle of Laser
4. What is meant by hologram
5. What is bravais lattice
6. What are Miller Indices
7. Distinguish between a dielectric material and an insulator
8. Distinguish between ferromagnetic and anti-ferromagnetic materials.
9. Explain the classification of Nano materials
10. Compare the merits. And demerits of SEM and TEM

PART – B

Note: Answer any five questions.

(5 x 10 = 50Marks)

- 11 a) Discuss the interference in a thin film by reflection.
b) Obtain the intensity expression for a single slit fraunhofer diffraction pattern.
- 12 a) Describe the recording and construction processes in holography with the help of suitable diagram.
b) Describe the Schrödinger time independent and time dependent wave equations
- 13 a) Explain the salient features of kroning - penny model and how it leads to energy band formation
b) Explain with a neat sketch the basic principle, working and the application of LED.
- 14 a) What is electronic polarization? Obtain an expression for electronic polarizability
b) What are magnetic Domains? Explain with suitable diagrams the hysteresis property of a ferromagnetic material.
- 15 a) Explain the weiss molecular field theory of ferromagnetism
b) Explain pulsed laser deposition technique.
- 16 a) Obtain an expression for acceptance angle and numerical aperture for an optical fibre
b) Distinguish between type-I and type – II super conductors
- 17 a) State and explain Hall effect? Obtain an expression for hall Co-efficient
b) Write a note on Atomic Force Microscopy (AFM)

FACULTY OF ENGINEERING

B. E. I – Semester (CBCS) (Backlog) Examination, March / April 2022

(Common for all Branches)

Subject: Engineering English

Time: 3 hours

Max. Marks: 70

Note: (Missing data, if any, may be suitably assumed)

PART – A (20 Marks)

1. Fill in the blanks with the appropriate verb forms.

- (a) The box has been/was so heavy that I could not lift it.
- (b) He was writing/has been writing a novel! Since October, and now he is about to finish it.
- (c) If you would have worked/has worked hard, you would have got a great.
- (d) He volunteered serving/to serve at the party.

2. Write one word substitute for the following:

- (a) One who is able to use both hands with equal skill _____
- (b) The art of effective or persuasive speaking or writing _____

3. Choose the correct antonym for the underlined words.

- (a) He was pleased with his birthday present.
(i) Cheerful (ii) Annoyed (iii) Awful (iv) None
- (b) His vocabulary is commendable
(i) Great (ii) Laudable (iii) Reprehensible (iv) Impressive

4. Fill in the blanks with suitable articles.

- (a) Their car does 150 miles _____ hour.
- (b) Is your father working in _____ old office building?
- (c) Mohan's father works as _____ electrician.
- (d) Where is _____ USB drive I lent you last week?

5. Rewrite the following sentences after correcting the errors if any.

- (a) If I had wings, I will have flown round the world.
- (b) She has entered into the hall from the first gate.

6. Fill in the blanks with the suitable prepositions.

- (a) Old people need someone to talk _____
- (b) It has been raining _____ two hours.
- (c) Granny is arriving _____ the 3.30 train.
- (d) He is senior _____ you.

7. Convert the following into passive form.

- (a) Declare the result.
- (b) Only twenty students in the class answered the problem.

8. Convert the following into indirect speech.

- (a) The teacher said, "The sun rises in the east".
- (b) The prince said "It gives me great pleasure to be here this evening".

9. Fill in the blanks with the suitable question tags.

- (a) Kalyan will come tonight, _____?
- (b) They are going home from school, _____ ?

10. Add suitable prefixes to the root words given in the brackets.

- (a) They are a little _____ (-mature) for the first grade.
- (b) He found his (-timely) death in a car accident.
- (c) It was a bit rude and _____ (-appropriate)
- (d) She had the _____ (-hap) of breaking her spectacles.

PART – B (50 Marks)

- 11. (i) Why are effective communications skills important for Engineers? Explain with examples.
- (ii) Explain any two communication barriers that cause communication breakdown.
- 12. (i) Comment briefly on different types of listening.
- (ii) Bring out differences between verbal and non-verbal communication.
- 13. (i) Write a letter to your friend inviting him to attend your brother's marriage.
- (ii) Discuss your views on "how to use internet judiciously".
- 14. How do Body language and its various aspects affect oral communication? Discuss.
- 15. What is a Report? Explain its key elements.
- 16. Explain how Satya Nadella has become an inspiration to Indian youth.
- 17. Why is Sachin Tendulkar regarded as one of the greatest batsmen in the history of cricket?

FACULTY OF ENGINEERING
B.E. I Year (NON-CBCS) (Backlog) Examination, March / April 2022

Subject: Mathematics - I

Time: 3 Hours

Max. Marks: 75

(Missing data, if any, may be suitably assumed)

PART – A

Note: Answer all questions.

(25 Marks)

1. Determine the nature of the series $\sum_{n=1}^{\infty} \left(\sqrt{n^3 + 2} - \sqrt{n^3} \right)$.
2. Determine the nature of the series $\sum_{n=1}^{\infty} \frac{(-1)^{n+1}}{3n+7}$.
3. Find the coefficient of x^2 in the Taylor's series expansion of $f(x) = e^{2x}$.
4. Find the envelope of the family of curves $y = px + \frac{3}{2p}$ where p is a parameter.
5. If $u(x, y) = x^2 + y$, $v(x, y) = x + y^2$ then find $\frac{\partial(u,v)}{\partial(x,y)}$.
6. Evaluate $\int_0^1 \int_{3x^2}^{4-x^2} x^2 y \, dy \, dx$.
7. If $\vec{r} = xi + yj + zk$ and \vec{a} is a constant vector, then evaluate $\text{curl}(\vec{a} \times \vec{r})$.
8. If $\vec{f} = (kx + 3y)i + (x - y)j - (x + y + z)k$ is solenoidal then find the value of K.
9. Find the rank of the matrix A $\begin{bmatrix} 99 & 100 & 101 & 102 \\ 100 & 101 & 102 & 103 \\ 101 & 102 & 103 & 104 \\ 103 & 104 & 105 & 106 \end{bmatrix}$
10. Determine whether the set $\{(1,2,3), (0,5,6), (0,10,13)\}$ is linearly independent or not.

PART – B

Note: Answer any five questions.

(5 x 10 = 50 Marks)

11. (a) Discuss the convergence of the series $\sum_{n=1}^{\infty} \left(\frac{n+3}{n+5} \right) x^n$ where $x > 0$.

- (b) Determine the nature of the series $\sum_{n=1}^{\infty} \frac{n^4}{n!}$.

12. (a) State and prove Cauchy's mean value theorem.
- (b) Find C value of Cauchy's mean value theorem for the functions $f(x) = e^x, g(x) = e^{-x}$ on $[3,5]$.

-2-

13. (a) Find the extreme values, if any of the function $f(x, y) = xy + \frac{8}{x} + \frac{1}{y}$.

(b) Find the extreme values of $f(x, y) = 5x + 2y$ subject to the condition

$$5x^2 + 2y^2 = 14.$$

14. Verify Gauss divergence theorem for $\vec{v} = x^2i + 2y^2j + 3z^2k$ where D is the region bounded by the cylinder $x^2 + y^2 = 9$, $z = 0$ and $z = 3$.

15. Find the matrix P which diagonalizes $A = \begin{bmatrix} 1 & 6 & 1 \\ 1 & 2 & 0 \\ 0 & 0 & 3 \end{bmatrix}$ and hence evaluate A^6 .

16. (a) Sketch the graph of the curve $y^2(a + x) = x^2(b - x)$.

(b) Find the evolute of the hyperbola $\frac{x^2}{a^2} - \frac{y^2}{b^2} = 1$.

17. (a) Evaluate $\int_0^1 \int_0^{1-x} e^{x+y} \frac{y}{dy} dx$.

(b) Evaluate $\int_0^1 \int_0^x \int_0^{x+y} (x+y+z) dz dy dx$.

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