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I/II Semester Diploma Examination, April/May-2019

APPLIED SCIENCE

Time : 3 Hours]

[Max. Marks : 100

- Instructions :**
- (i) Answer any **10** questions from Section – A. Each question carries **2** marks.
 - (ii) Answer any **10** questions from Section – B. Each question carries **5** marks.
 - (iii) Answer any **5** questions from Section – C. Each question carries **6** marks.

SECTION - A

(Answer any ten questions.)

$10 \times 2 = 20$

1. Name fundamental physical quantities and give their S.I. units. **2**
2. Write the SI unit of temperature and solid angle. **2**
3. State the law of triangle of forces. **2**
4. Define unlike parallel forces. **2**
5. State Hooke's law. **2**
6. Define surface tension. **2**
7. Define angle of contact in liquids. **2**
8. Define radiation. **2**

9. State Boyle's law. 2
10. Define Oscillation. 2
11. Define resonance. 2
12. Write any two applications of LASER. 2
13. Write any two applications of optical fibers. 2
14. Define electrolyte. 2
15. Define corrosion. 2

SECTION - B

(Answer any ten questions)

 $10 \times 5 = 50$

16. Draw a neat diagram of screw gauge and name its parts. 5
17. Define moment of force. Write the conditions of equilibrium of co-planar parallel forces. 5
18. Define : Tensile stress and Shear stress & write unit of strain. 5
19. Define thrust of a liquid. Derive $p = \rho gh$. 5
20. Define viscosity. Write any three applications of viscosity. 5
21. Explain conduction, convection with one example each. 5

22. Define specific heat of a substance and write its SI unit. State second law of thermodynamics. 5
23. Derive an expression for displacement of particle executing SHM. 5
24. Define stationary wave. Mention any three characteristics of stationary waves. 5
25. Explain electromagnetic waves. Write any three uses of microwaves. 5
26. Define communication. Mention the basic elements required for the communication system. 5
27. State the Faraday's laws of electrolysis. 5
28. Explain composition cell, stress cell & concentration cell. 5
29. Explain any three classification of polymers. 5
30. Define solute, solvent and solutions. 5

SECTION - C

(Answer any five questions)

 $5 \times 6 = 30$

31. Describe an experiment to verify the Lami's theorem. 6
32. Describe an experiment to determine co-efficient of viscosity of water by Poiseulle's Method. 6
33. Define temperature. The volume of a gas is 200 cc at 25 °C. Calculate the volume of gas at 60 °C. 6

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12. Consider the following set of process with the length of the CPU burst time given in milliseconds. 10

Process	Burst time	Priority
P ₁	10	3
P ₂	1	1
P ₃	2	4
P ₄	1	5
P ₅	5	2

The processes are assumed to have arrived in the order P₁, P₂, ... P₅, all at time 0.

- (i) Draw the Gantt chart for FCFS and PRIORITY scheduling algorithms.
- (ii) Calculate the waiting time of each process for FCFS and PRIORITY scheduling algorithms.
- (iii) Calculate the average waiting time for FCFS and PRIORITY scheduling algorithms.

13. Explain Resource – allocation graph with deadlock and without deadlock with examples. 10

14. What is segmentation ? Draw and explain its hardware support. 10

15. (a) Explain Swapping technique with a neat diagram. 5
 (b) Briefly explain fragmentation and its types. 5

16. Consider the following reference string : 10

7 0 1 2 0 3 0 4 2 3 0 3 2 1 2 0 1 7 0 1

How many page faults would occur for the following page replacement algorithm assuming 3 page frames ?

- (i) FIFO page replacement
- (ii) Optimal page replacement.

17. Explain the steps for handling page fault with a neat diagram. 10

18. Explain single-level directory and two-level directory with a neat diagram. 10

19. Define file and explain the different file attributes. 10

34. Describe an experiment to determine the velocity of sound in air at lab temperature using resonance air column apparatus. 6
35. Explain Newton's formula for velocity of sound in air and Laplace Correction for it. 6
36. State the laws of transverse vibrations of a stretched string. 6
37. Define nano technology. Write any four applications of nano-technology. 6
38. Define Battery. Mention types of batteries and their uses. 6