

VITEEE 2025 Apr 25 Shift 2 Question Paper

1. The moment of inertia of a thin ring about its diameter is:

- (A) MR^2
 - (B) $\frac{1}{2}MR^2$
 - (C) $\frac{1}{4}MR^2$
 - (D) $2MR^2$
-

2. A Carnot engine operates between 400 K and 300 K. Its efficiency is:

- (A) 25%
 - (B) 30%
 - (C) 75%
 - (D) 100%
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3. In Young's double-slit experiment, the slits are 0.2 mm apart and the screen is 1 m away. The distance between the central bright fringe and the third bright fringe is 1.5 cm. The wavelength of light used is:

- (A) 500 nm
 - (B) 600 nm
 - (C) 700 nm
 - (D) 400 nm
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4. The binding energy per nucleon is maximum for:

- (A) ${}^2\text{H}$
 - (B) ${}^4\text{He}$
 - (C) ${}^{56}\text{Fe}$
 - (D) ${}^{238}\text{U}$
-

5. The functional group in ethers is:

- (A) –OH
 - (B) –CHO
 - (C) –O–
 - (D) –COOH
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6. Which of the following is not a buffer solution?

- (A) $\text{CH}_3\text{COOH} + \text{CH}_3\text{COONa}$
 - (B) $\text{NH}_4\text{OH} + \text{NH}_4\text{Cl}$
 - (C) $\text{H}_2\text{SO}_4 + \text{Na}_2\text{SO}_4$
 - (D) $\text{HCN} + \text{KCN}$
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7. The hybridization in SF_6 molecule is:

- (A) sp^3
 - (B) sp^3d
 - (C) sp^3d^2
 - (D) dsp^2
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8. The heat of neutralization is maximum for:

- (A) Weak acid and weak base
 - (B) Strong acid and strong base
 - (C) Strong acid and weak base
 - (D) Weak acid and strong base
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9. If $\cos \theta = -\frac{3}{5}$ and θ lies in the second quadrant, then $\sin \theta$ is:

- (A) $\frac{4}{5}$
 - (B) $-\frac{4}{5}$
 - (C) $\frac{3}{5}$
 - (D) $-\frac{3}{5}$
-

10. The equation of the tangent to the curve $y = x^3 - 2x + 1$ at $(1, 0)$ is:

- (A) $y = x - 1$
 - (B) $y = x + 1$
 - (C) $y = -x + 1$
 - (D) $y = x$
-

11. The value of $\int e^x(\sin x + \cos x) dx$ is:

- (A) $e^x \sin x + C$
 - (B) $e^x \cos x + C$
 - (C) $e^x \sin x - e^x \cos x + C$
 - (D) $e^x(\sin x + \cos x) + C$
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12. If the coefficient of correlation between x and y is 0.8, then the regression coefficient of y on x is:

- (A) Always 0.8
 - (B) Always greater than 0.8
 - (C) Depends on standard deviations
 - (D) Always less than 0.8
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13. The number of ways to arrange the letters of the word “MISSISSIPPI” is:

- (A) 34650
 - (B) 12600
 - (C) 9450
 - (D) 69300
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14. A boat takes 4 hours to travel 40 km downstream and 6 hours to return. The speed of the stream is:

- (A) 2 km/h
- (B) 4 km/h

(C) 6 km/h

(D) 8 km/h

15. If the 5th term of a G.P. is 81 and the 8th term is 6561, the first term is:

(A) 3

(B) 9

(C) 1

(D) 27

16. Find the odd one out: 16, 25, 36, 49, 64, 81, 100

(A) 16

(B) 36

(C) 81

(D) 100

17. If 'PEN' is coded as '371' and 'INK' is coded as '946', then 'PIN' is coded as:

(A) 391

(B) 379

(C) 739

(D) 937

18. Choose the antonym of "Benevolent":

(A) Kind

(B) Generous

(C) Malevolent

(D) Friendly

19. Fill in the blank: The committee ____ divided on the issue.

(A) is

(B) are

(C) were

(D) have

20. Find the next number in the series: 1, 4, 13, 40, 121, ?

(A) 244

(B) 364

(C) 484

(D) 363
