TS EAMCET May 10 Shift 2

Question Paper

Conducted by JNTU, Hyderabad

General Instructions

(i) The test is of 3 hours duration.

(ii) This test paper consists of 160 questions. The maximum marks are 720.

(iii) Physics and Chemistry contains 40 questions each and Mathematics contains 80 questions.

(iv) Each question carries +1 marks for correct answer and there is no negative marking for wrong answer.

Mathematics

1. If ω is a complex cube root of unity, then

$$\cos\left(\left(\omega^{1234}+\omega^{2021}\right)\pi-\frac{\pi}{4}\right)=$$

(A) $-\frac{1}{\sqrt{2}}$

(B) $\frac{1}{\sqrt{2}}$

(C) $\frac{\sqrt{3}}{2}$

(D) $-\frac{\sqrt{3}}{2}$

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2. If the system of equations

$$x+y+z=1, \quad x+2y+4z=K, \quad x+4y+10z=K^2$$

is consistent, then $K=$

(A) $1,-2$

(B) $-1, 2$

(C) $1, 2$

(D) $-1, -2$

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3. If 2 and 3 are the two roots of the equation

$$2x^3 + mx^2 - 13x + n = 0,$$

then the values of m, n are respectively

(A) $-5, 30$

(B) $5, -30$

(C) $-5, -30$

(D) $5, 30$

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4. If $-1 + i$ is a root of the equation $x^4 + 4x^3 + 5x^2 + 2x - 2 = 0$, then the real roots of this equation are

(A) $-1 \pm \sqrt{3}$

(B) $-1 \pm \sqrt{2}$

(C) $\sqrt{2} \pm 3$

(D) $\sqrt{3} \pm \sqrt{2}$

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5. T_m denotes the number of triangles that can be formed with the vertices of a regular polygon of m sides. If $T_{m+1} - T_m = 15$, then $m =$

(A) 3

(B) 6

(C) 9

(D) 12

Physics

1. A car is moving with velocity V at the top of a semi-circular hill of radius 40 m such that the normal force on it is zero. Find the velocity (V) of the car. [use $g = 10\,\text{ms}^{-2}$]

(A) $10\,\text{m/s}$

(B) $15\,\text{m/s}$

(C) $20\,\text{m/s}$

(D) $25\,\text{m/s}$

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2. If the average terminal velocity of rain drop is 2 ms^{-1}, then the energy transferred by rain to each square meter of the surface at a place which receives 100 cm of rain in a year is

(A) $1 \times 10^4\,\text{J}$

(B) $1 \times 10^3\,\text{J}$

(C) $2 \times 10^3\,\text{J}$

(D) $2 \times 10^4\,\text{J}$

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3. A particle executes simple harmonic motion according to the equation $x(t) = A\sin^2(\alpha t)$. If the time period of the S.H.M is 0.2 s, then the value of α (in units of rad/s) is:

(A) 2π

(B) 10π

(C) 5π

(D) 2.5π

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4. Consider a series of measurements of the length of a box in an experiment. The readings are 2.4m, 2.5m, 2.6m, 2.8m, 3.0m. What would be the relative error?

(A) 0.110

(B) 0.089

(C) 0.079

(D) 0.072

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5. The volume of a material reduces by 2% when the pressure is increased from 1 atm to 2 atm. What is its bulk modulus?

(A) $10^5\,\text{N/m}^2$

(B) $5 \times 10^5\,\text{N/m}^2$

(C) $10^6\,\mathrm{N/m^2}$

(D) $5 \times 10^6\,\mathrm{N/m^2}$

Chemistry

1. A balloon filled with an air sample occupies 3 L volume at 35 °C. On lowering the temperature to T, the volume decreases to 2.5 L. The temperature T is [Assume P constant]

(A) $25.67\,^\circ\mathrm{C}$

(B) $29.17\,^\circ\mathrm{C}$

(C) $-16.33\,^\circ\mathrm{C}$

(D) $-20.55\,^\circ\mathrm{C}$

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2. The order of the average bond length of the given bonds is

(A) $C=O < C=N < C=C < N-O$

(B) $C=C < C=O < C=N < N-O$

(C) $C=C < C=O < N-O < C=N$

(D) $C=N < C=O < N-O < C=C$

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(D) $5 \times 10^6\,\mathrm{N/m^2}$

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4. Which of the following is not a periodic property?

(A) Atomic size

(B) Electron affinity

(C) Radioactivity

(D) Ionisation potential

5. The number of radial nodes in 3s and 2p orbitals, respectively are

(A) 2 : 2

(B) 2 : 0

(C) 0 : 0

(D) 3 : 2