

B.E./B.Arch. Entrance Examination-2081

Model Questions

Section A

(1*60 = 60)

1. The value of k for which one root of the equation $3x^2 + 7x + 6 - k = 0$ is equal to zero is
a) $-\frac{7}{3}$ b) 0 c) $\frac{7}{3}$ d) 6
2. The derivative of $\operatorname{sech}^{-1}x$ is valid for
a) $x = 0$ b) $x < 1$ c) $x = 1$ d) $x > 1$

3. The integrating factor of the differential equation $\frac{dy}{dx} + \frac{x}{1+x} y = 1 + x$ is
- a) e^x b) $\frac{e^x}{1+x}$ c) $\frac{e^x}{x}$ d) $e^x(1+x)$
4. If the line $x + y - 1 = 0$ touches the parabola $y^2 = kx$, then the value of k is
- a) 4 b) 2 c) -2 d) -4
5. Two ice blocks when pressed together join to form one block, because,
- a) MP rises with pressure b) MP falls with pressure
c) Heat is absorbed from surrounding d) Heat is rejected to surrounding
6. If you are given three equal resistors, how many different combinations of these resistors are possible?
- a) 2 b) 3 c) 4 d) 6
7. In Williamson's synthesis haloalkane is treated with
- a) ammonia b) alcohol c) sodium alkoxide d) silver salt of fatty acid
8. Any p-orbital can accommodate up to
- a) six electrons b) four electrons
b) two electrons with parallel spins d) two electrons with anti-parallel spins
9. He is one person, I count in times of difficulty.
- a) at b) in c) with d) on
10. The word 'procrastination' has its stress on the syllable.
- a) 2nd b) 3rd c) 4th d) 5th
11. Which of the following pairs have the same initial vowel sound?
- a) ago, alone b) inn, eel c) owl, all d) up, on

Section B

(2*40 = 80)

12. If a lottery ticket is drawn at random from a lottery box containing 10 prizes and 25 blanks, what is the probability of getting a prize?
- a) $\frac{1}{10}$ b) $\frac{1}{25}$ c) $\frac{2}{7}$ d) $\frac{5}{7}$
13. If $\vec{a} = \vec{i} + 2\vec{j} + 3\vec{k}$ and $\vec{b} = 2\vec{i} + 3\vec{j} - 2\vec{k}$, then the projection of $\vec{b}$ on $\vec{a}$ is
- a) $\frac{2}{\sqrt{17}}$ b) $\frac{2}{\sqrt{7}}$ c) $\sqrt{\frac{2}{7}}$ d) $\frac{1}{7}$
14. To what depth, below the surface of a sea should a rubber ball be taken so that its volume decreases by 1%? Bulk modulus of the rubber is $9 \times 10^8 \text{ Nm}^{-2}$.
- a) 1m b) 10m c) 100m d) 1km
15. The ratio of the areas within the electron orbits for the first excited state to the ground state for the hydrogen atom is
- a) 16:1 b) 8:1 c) 4:1 d) 2:1

16. 21 grams of magnesium carbonate was treated with 50ml of 12N hydrochloric acid. How many molecules of untreated hydrochloric acid remain in this reaction?
a) 6.025×10^{23} b) 6.025×10^{22} c) 6.025×10^{21} d) 6.025×10^{19}
17. What weight of copper will be deposited by passing 2 Faraday of electricity through a solution of copper salt?
a) 20g b) 31.7 g c) 63.5g d) 100g
18. It two weeks since he left the city.
a) is b) was c) has been d) had been
19. **Read the following passage carefully and answer the questions given below by selecting the correct option.**

Language, as they say, is the lens through which human beings perceive the world. If so, English is perhaps the most distorting lens through which to see animals. It has perpetuated a cross-eyed view of birds, beasts, fish and fowl. The very word 'animal' connotes the brutish and the sensual. Animal instinct implies baseness and vulgarity. The language transfers negative human traits to animals, making the former appear as characteristics of the latter. Thus, the chicken is cowardly, frightened, faint-hearted; the goat lustful and foolish; the bear rough and ill-bred. Butterflies are flighty, seals slippery and foxes notorious for craftiness and cunning. Much the worst are the reptiles particularly the snake, creeping, base, malignant, abject, ungrateful and treacherous. Always the snake in the grass.

Each species carries its denigration forever embedded in its English name giving the language as many unpleasant adjectives as it could possibly want. To be bull-headed is to be impetuous and obstinate; the cattish woman is spiteful and backbiting. An elephant's walk is ungainly, bird-brains are to be ridiculed and the herd mentality draws only contempt. You can be as blind as a bat, and batty if you are crazy as well.

In the English language, the animals are

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|---------------------------------------|------------------------------------|
| a) used for uninteresting comparisons | b) used for unpleasant comparisons |
| c) used for pleasant comparisons | d) not used for any comparisons |
