and movement, growth, aging and death. Hormones - types of hormones, functions and disorders.

9.Biotechnology and its applications

Recombinant DNA technology, applications in health, agriculture and industries; genetically modified organisms; Human insulin, vaccine and antibiotic production. Stem cell technology and gene therapy. Apiculture and animal husbandry. Plant breeding, tissue culture, single cell protein, fortification, Bt crops and transgenic animals. Microbes in food processing, sewage treatment, waste management and energy generation. Biocontrol agents and biofertilizers. Bio-safety issues, biopiracy and patents.

10.Biodiversity, ecology and environment

Ecosystems: components, types, pyramids, nutrient cycles (carbon and phosphorous), ecological succession and energy flow in an ecosystem; Biodiversity - concepts, patterns, importance, conservation, hot spots, endangered organisms, extinction, Red data book, botanical gardens, national parks, sanctuaries, museums, biosphere reserves and Ramsar sites. Environmental issues: pollution and its control. Population attributes - growth, birth and death rate and age distribution.

VITEEE - 2018 – SYLLABUS
ENGLISH

INSTRUCTIONS TO THE CANDIDATES

1. Question Nos. 121 to 125 are questions on English and it will be **Multiple Choice Questions**

2. Question No. 121, 122 and 123 are Comprehension questions. They are based on short passages (30 -50 words) or lines of poems (2 -3) or a dialogue (2 exchanges)

3. Question No. 124 and 125 are based on **English Grammar and Pronunciation.**

4. The candidates should read the texts and the questions that follow carefully and choose the
CORRECT/ BEST answer from the options given for each question.

*Please note that the passages, lines of poems, dialogues, grammar and pronunciation items are chosen to suit the level of VITEEE takers

APPENDIX – V
SAMPLE QUESTIONS

PHYSICS

1. If a force $F = (2x + 3x^2)\hat{i}$ N acts along x-axis on an object and moves it from x = 2m to x = 4m, the work done is

   A) 24 J   B) 68 J   C) 86 J   D) 142 J

2. A vessel contains 1 mol of O_2 and 2 mol of He. What is the value of 'C_P/C_V' of the mixture?

   A) 17/11   B) 71/45   C) 38/15   D) 46/15

3. Figure shows some of the electric field lines corresponding to an electric field. The figure suggests that
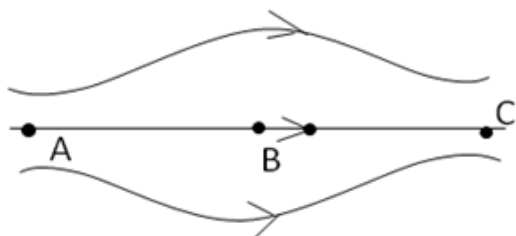
   A) $E_A > E_B > E_C$ B) $E_A = E_B = E_C$ C) $E_A = E_C > E_B$ D) $E_A = E_C < E_B$

4. A carbon resistor has color code as, Red, Black, Blue and Gold. The resistance and tolerance values are

   A) 20 MΩ ±5%   B) 20 MΩ ±10%   C) 20 kΩ ±5%   D) 20 kΩ ±10%

5. A small circular flexible loop of wire of radius r carries a current I. It is placed in a uniform magnetic field B. The tension in the loop will be doubled if

   A) I is doubled   B) B is halved   C) r is doubled   D) Both B and I are doubled

6. What is the self-inductance of a coil when a change of current from 0 to 2 A in 0.05 s induces an *emf* of 40 V in it?

   A) 1 H   B) 2 H   C) 3 H   D) 4 H

7. A light has the wavelength 6000 Å in air and 4500 Å in water. Then the speed of light in water will be

   A) 5.0×10^{14} m/s   B) 2.25×10^8 m/s   C) 4.0×10^8 m/s   D) 1.0×10^8 m/s

8. In which of the following transitions in hydrogen atom will the wavelength be minimum?

   A) n = 5 to n = 4   B) n = 4 to n = 3   C) n = 3 to n = 2   D) n = 2 to n = 1

9. One gram of Radium, with atomic weight 226, emits 4×10^{10} particles per second. The half-life of Radium is

   A) 4.6×10^{10} s   B) 4.6×10^9 s   C) 4.6×10^{12} s   D) 4.6×10^{14} s

10. The minimum number of NAND gates required to implement $A + A\overline{B} + A\overline{B}C$ is

    A) 3   B) 2   C) 6   D) zero

CHEMISTRY

1. The nucleus of an element contains 11 protons. Its valency would be

   A) 0   B) 1   C) 2   D) 3

2. Identify the lanthanide which is obtained only by synthesis.

   A) Lu   B) Pm   C) Pr   D) Gd

3. Which one of the following compounds shows Frenkel defect?

   A) ZnS   B) CsCl   C) FeO   D) NaCl

4. A cylinder of cooking gas supplied by Indian Oil Corporation is assumed to contain 14 kg of butane (ΔH_c for C_4H_{10} = - 2600 kJ mol^{-1}). If a small family of three persons, requires 10,000 J of heat energy per day for cooking, the gas in the cylinder would last for

   A) 44 days   B) 54 days   C) 72 days   D) 63 days

5. The molar conductivities of infinite dilution for sodium iodide, sodium acetate and aluminium acetate are 12.69, 9.10 and 24.52 S cm^2 mol^{-1} respectively at 25 °C. What is the molar conductivity of AlI_3 at infinite dilution?

   A) 35 S cm^2 mol^{-1} B) 32 S cm^2 mol^{-1} C) 28 S cm^2 mol^{-1} D) 40 S cm^2 mol^{-1}

6. The number of structural isomers for the alcohols with the formula $C_5H_{11}OH$ is

   A) 4   B) 6   C) 8   D) 10

7. The best reagent to convert pent-3-en-2-ol into pent-3-en-2-one is

   A) pyridinium chloro-chromate   B) acidic dichromate   C) acidic permanganate   D) chromic anhydride in glacial acetic acid

8. The correct order of reactivity of PhMgBr with

   A) I > II > III   B) III > II > I   C) II > III > I   D) I > III > II

9. The product Z in the following reaction sequence is

   A) CH_3CN B) CH_3OH C) CH_3CONH_2 D) CH_3CH_2OH

10. An unknown amine is treated with an excess of methyl iodide. Two equivalents of methyl iodide react with the amine. The amine is treated with silver oxide and water, and then heated to 120 °C. The resulting products are trimethylamine and ethylene. The unknown amine is

    A) $CH_3CH_2NHCH_3$ B) $CH_3CH_2NH_2$ C) $CH_2 = CHNH_2$ D) $CH_2 = CHNHCH_3$

MATHEMATICS

1. If A is a non-singular matrix and $(A - 2I)(A - 4I) = [0]$, then $\frac{1}{6}A + \frac{4}{3}A^{-1}$ is

   A) [0]   B) I   C) 2I   D) 6I

2. The amplitude of the complex number $Z = \dfrac{-1 + i\sqrt{3}}{2}$ is

   A) $\dfrac{\pi}{6}$ B) $\dfrac{\pi}{3}$ C) $\dfrac{2\pi}{3}$ D) $\dfrac{4\pi}{3}$

3. The eccentricity of ellipse $4x^2 + 9y^2 - 16x = 20$ is

   A) $\dfrac{\sqrt{5}}{3}$ B) $\dfrac{2}{3}$ C) $\dfrac{1}{3}$ D) $\dfrac{4}{3}$

4. If $\bar{a}$ and $\bar{b}$ are unit vectors and θ is the angle between $\bar{a}$ and $\bar{b}$ then $\sin\frac{\theta}{2}$ is equal to

   A) 1   B) $\frac{1}{2}\left|\bar{a} - \bar{b}\right|$ C) 0   D) $\frac{1}{2}\left|\bar{a} + \bar{b}\right|$

5. The image of the point $(1, 2, 4)$ in the plane $2x - y + z + 2 = 0$ is

   A) $(-3, 4, 2)$ B) $(3, -4, 2)$ C) $(-3, -4, 2)$ D) $(-3, 4, -2)$

6. $\lim\limits_{x \to 0}[1 + x\sin(\pi - x)]^{\frac{1}{x}}$ is equal to

   A) 0   B) e   C) 1   D) π

7. $\displaystyle\int_{0}^{\pi} \log(\sin^2 x)\, dx = 0$

   A) $2\pi \log_e\left(\frac{1}{2}\right)$ B) $2\pi \log_e(2)$ C) $\pi \log_e\left(\frac{1}{2}\right)$ D) $\pi \log_e(2)$

8. The general solution of the differential equation $2x + \dfrac{dy}{dx} - y = 3$ at the origin is

   A) $y = 2x - 1$ B) $x^2 + y^2 = 2x - 1$ C) $y = C_1 e^x + 2x - 1$ D) $y^2 = C_1 e^x + 2x - 1$

9. A die is thrown 100 times. Getting an even number is considered as a success , the variance of number of successes is

   A) 50   B) 25   C) 10   D) 100

10. In the set of integers under the operation $a \times b = a + b - ab$ the identity element is

    A) 0   B) 1   C) a   D) b

BIOLOGY

1. Which of the following protozoans live in guts of termites and help them to digest cellulose?
A) Plasmodium   B) Amoeba proteus   C) Trichonympha   D) Trypanosoma

2. The function of centromere is to
A) Move the chromosomes B) Divide the centrosomes
C) Form nuclear spindle D) Form spindle fibers

3. An embryo sac in higher plants at maturity has
A) 4 nuclei   B) 7 nuclei   C) 8 nuclei   D) One nucleus

4. Gene assort independently from one another. How many genotype can be produced if the number of heterozygous gene pairs is four?
A) 4   B) 8   C) 81   D) 64

5. Which deficiency in humans causes Alzheimer's disease?
A) GABA   B) Dopamine   C) Acetylcholine   D) Glutamic acid

6. In Lineweaver-Burk plot, the Y intercept represents
A) V_{max} B) K_m C) $1/V_{max}$ D) $1/K_m$

7. Which one of the following doesn't play any role in photosynthesis?
A) Phycocyanin   B) Xanthophylls   C) Phycoerythrin   D) Anthocyanin

8. Fertilizin is a chemical substance produced from
A) Mature eggs   B) Acrosome   C) Polar bodies   D) Middle piece of sperm

9. Introduction of DNA into the bacteria by exposing the cells to millisecond jolts of tens of thousands of volts is
A) Electro fusion   B) Electro fission   C) Electrolysis   D) Electroporation

10. Which of the following is not a functional unit of ecosystem?
A) Productivity   B) Energy flow   C) Stratification   D) Decomposition

ENGLISH

1. Read carefully the piece of conversation and the question that follows. Choose the correct answer:

DERRY: I thought it was empty...an empty house.
MR LAMB: So it is. Since I'm out here in the garden. It is empty.
Until I go back inside. In the meantime, I'm out here and
likely to stop. A day like this. Beautiful day. Not a day to be indoors.

Why is MR LAMB outside his house?
A) He does not like to be indoors
B) He loves to enjoy the beautiful day
C) He has lot of leisure time
D) He wants to keep the house empty

2. Read carefully the passage and the question that follows. Choose the correct answer.

...the unmitigated burning of fossil fuels has now created a blanket of carbon dioxide around the world, which is slowly but surely increasing he average global temperatre.

The author mentions carbon dioxide emission as a cause for global warming, What else causes global warming?
A) Methane Emission   B) Coal Mining   C) Liquefied Petroleum   D) Atomic Energy

3. Read carefully the passage and the question that follows. Choose the correct answer.

Food is more important for survival than an identity. "If at the end of the day we can feed our families and go to bed without an aching stomach, we would rather live here than in the fields that gave us no grain," say a group of women in tattered saris...

The passage makes a comparison between _____ and _____

A) Survival and Identity   B) Food and Family   C) Food and Identity   D) Women and Saris

4. Read carefully the following stanza of a poem and the question that follows. Choose the correct answer.

We have imagined for the mighty dead;
All lovely tales that we have read
An endless fountain of immortal drink,
Pouring unto us from the heaven's brink.

What is the rhyme scheme?
A) aaab   B) abbc   C) abcd   D) aabb

5. How many syllables are there in the word - 'ENVIRONMENT' ? Choose the correct answer?
A) 4   B) 3   C) 5   D) 6