

SRI CHAITANYA EDUCATIONAL INSTITUTIONS, INDIA

A.P. TELANGANA, KARNATAKA, TAMILNADU, MAHARASHTRA, DELHI, RANCHI

 SR ELITE
 Date: 26.03.19

 TIME: 3 Hrs.
 NEET UNIT TEST - 2
 Max.Marks: 180

IMPORTANT INSTRUCTIONS:

- + Pattern of the Entrance Examination :
 - Paper containing 180 objective type questions from Biology, Physics and Chemistry.
- + Use Blue/Black Ball Point Pen only to darken the appropriate circle. Answers marked with pencil would not be evaluated.
- + Each item carries **4marks**. For each correct response the candidate will get 4 marks. For each incorrect response **1mark** will be deducted from the total score.
- 1. Radical buds are present in
 - (1) Datura
 - (2) Dolichos
 - (3) Dahlia
 - (4) Derris
- 2. Leafisused as a propagule in
 - (1) Bryophyllum
 - (2) Nepenthes
 - (3) Neem
 - (4) Maize
- 3. Zygote develops into an adult plant by undergoing
 - (1) Cell division
 - (2) Differentiation
 - (3) Dedifferentiation
 - (4) More than one option is correct
- 4. Gametophytes are independent in
 - (1) Carica, Chara
 - (2) Cycas, Carica
 - (3) Chara, Marchantia
 - (4) Marchantia, Musa
- 5. Cork cambium in dicot during secondary growth root develops from
 - (1) Pericycle
 - (2) Endodermis
 - (3) General Cortex
 - (4) Conjuctive tissue
- 6. Simple tissue that can not show photosynthetic activity
 - (1) Parenchyma
 - (2) Collenchyma
 - (3) Sclerenchyma
 - (4) Primary xylem

- 7. Conjoint, collateral vascular bundles are present in
 - (1) Roots, stems, leaves
 - (2) Stems, roots only
 - (3) Stems, leaves only
 - (4) Stems only
- 8. Photosynthetic tissue formed during secondary growth of dicot stem is
 - (1) Phelloderm
 - (2) Phellogen
 - (3) Phellum
 - (4) Periderm
- Light colour wood formed during secondary growth in dicot stem is
 - (1) Sap wood, Late wood
 - (2) Heart wood, Early wood
 - (3) Heart wood, Late wood
 - (4) Sap wood, Early wood
- 10. Linear growth of grass stem is due to
 - (1) Apical meristem only
 - (2) Intercalary meristem only
 - (3) Both apical and intercalary meristem
 - (4) Lateral meristems
- 11. Antivenom injection contains preformed antibodies while polio drops that are administered into the body contain:
 - (1) Activated pathogens
 - (2) Harvested antibodies
 - (3) Gamma globulin
 - (4) Attenuated pathogens

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12. Which the particular type of drug that is obtained from the plant whose flowering branch is shown below?



- (1) Depressant
- (2) Stimulant
- (3) Pain killer
- (4) Hallucinogen
- 13. \mathcal{M} atch the following d is eases (Column– I) with their causative agent (Column II) and select the correct option

	Column - I		Column – II
a)	Gono <i>rr</i> hea	i)	Trichophyton
b)	Delhi boils	ii)	Neisseria
c)	Typhus feve r	iii)	Leishmania
d)	Ring worm	iv)	Rickettsia

Options:

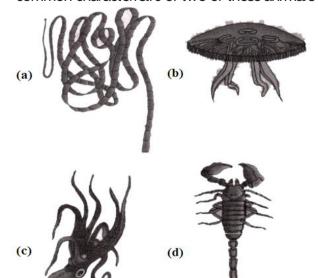
	a)	b)	c)	d)
(1)	(ii)	(iii)	(iv)	(i)
(2)	(iii)	(iv)	(i)	(ii)
(3)	(iv)	(ii)	(iii)	(i)
(4)	(iv)	(iii)	(ii)	(i)

- 14. $\mathcal{M}AL\mathcal{T}$ constitutes about ____percent of the lymphoi d tissue in human bo dy.
 - (1) 50%
 - (2) 20%
 - (3) 70%
 - (4) 10%
- 15. Transplantation of tissues / organs fails often due to non-acceptance by the patient's body. Which type of immune -response is responsible for such rejection
 - (1) Autoimmune response
 - (2) Cell-mediated immune response
 - (3) Humoral immune response
 - (4) Antibody mediated immune response
- 16. Which of the following sets of *d*iseases is cause *d* by bacteria?
 - (1) Cholera and tetanus
 - (2) Typhoid and small pox
 - (3) Tetanus and mumps
 - (4) Herpes and influenza

- 17. Which of the following diseases is caused by a protozoan?
 - (1) Peptic ulcers
 - (2) Typhoid fever
 - (3) Anthrax
 - (4) Kala azar
- Choose the option in which the disease, its mode of infection and one symptom of it are correctly matched.

	Disease	Mode of infection	Symptom
(1)	Diphtheria	Through contaminated food	Intestinal perforation
(2)	Pneumonia	<i>I</i> nhalation of <i>dr</i> oplets	Fluidin alveoli
(3)	Common col d	Through contaminated food	Sore throat
(4)	Amoebiasis	Bite of female mosquito	Stool with mucus and blood dots

- 19. Which group of animals belong to the same phylum?
 - (1) £arthworm, Pinworm, Tapeworm
 - (2) Prawn, Scorpion, Locusta
 - (3) Sponge, Sea anemone, starfish
 - (4) Malarial parasite, Amoeba, Mosquito
- 20. The figure shows four animals a), b), c) and d).
 Select the correct answer with respect to a common characteristic of two of these animals



- (1) a) and d) have cni doblasts for self-defense
- (2) c) and d) have a true coelom
- (3) a) and d) respire mainly through body wall
- (4) b) and c) show radial symmetry

*2***1**. One of the following types of meristems is not To form 40 zygotes; the minimum number of *2*9. involved in secondary growth in dicots meiotic divisions that should occur in pollen mother cells is (1) Intra fasicular cambium (1) 10 (2) Inter fasicular cambium (2) 16 (3) Inter calary meristem 8 (4) Phellogen (3)**(4)** 12 Pressure gradient in sieve tubes of phloem in 22. angiosperms is maintained by 30. Hygroscopic cells are present in the following (1) Companion cells parts of plants (2) Albuminous cells (1) Leaves of grasses (3) Complementary cells (2) Velamen tissue of root (4) Bundle sheath cells (3) Anther wall (4) More than one option is correct *2*3. The number of fertile cells in a fully mature male gametophyte of angiopsperms is 31. Which of the following is an example of platyhelminthes? (1) 4 (2) (1) Rhabditis 2 (2) Schistosoma (3)1 (3)(4) 8 Wuchereria (4) Locusta *2***4**. Ubisch bodies are related to this part of pollen In which of the following fish the skin is tough **3**2. grain (1) **Exine** containing minute placoi d scales? (1) Exocoetus *I*ntine (2) (3)£ndothecium (2) Hippocampus Scoliodon (3)(4) None Number of mitotic spindles formed during the (4) Labeo *2***5** formation of monosporic type of embryosac 33. Which of the following is $\mathcal{N}O\mathcal{T}$ a feature of cartilagenous fish? (1) Internal fertilization (2) 11 (1) (2) Viviparity (3) 7 (3) \mathcal{M} ales have daspers formed from their (4) 4 *2*6. Polyembryony is seen in pelvic fins Gills are covered by an operculum on (1) Mango (2) Cycas each si de 34. Which of the following is not a character of (3) Citrus reptiles? (4) All of these Body covered by dry and cornified Dioecious plants can show (1) *2***7**. skin (1) Autogamy, Xenogamy They are poikilotherms (2) Geitonogamy, Xenogamy (2) Fertilisation is external (3)(3) Xenogamy only Heart is three chambered but four (4) (4) Autogamy, Geitonogamy chambered in crocodiles Effect of genes of pollen on endosperm and 28 35. Find the INCORRECT match embryo development is called (1) Xenia (1) Dentalium - Tusk shell (2) Loligo – Cuttlefish (2) Metaxenia (3) Aplysia - Sea-hare (3) Apomixis (4) Pila - Apple snail (4) Polyderm **Educational Institutions** Page 3 Sri Chaitanya

- 36. Among the following organisms; point out a free living, non-parasitic form
 - (1) Tape worm
 - (2) Planaria
 - (3) Roundworm
 - (4) Pin worm
- 37. A classic example of point mutation is
 - (1) Down's syndrome
 - (2) Sickle cell anaemia
 - (3) Cri-du-chat syndrome
 - (4) Turner's syndrome
- 38. A Barr body is a/an
 - (1) Hyperactive X-chromosome
 - (2) Supernumerary Y-chromosome
 - (3) Inert X-chromosome
 - (4) Extranuclear DNA mass
- 39. Thalassemia is
 - (1) A quantitative problem of haemoglobin
 - (2) A qualitative problem of haemoglobin
 - (3) Characterized by mental retardation
 - (4) Characterized by lack of secondary sexual characters
- 40. Identify the correct combination

Column-I	Column-II
(Organism)	(Sex determined by)
(1) Drosophila	Ho _r mones
(2) Apis	Haplo-diploidy
(3) Grasshopper	ZO-ZZ method
(4) Poultry fowl	Male heterogamety

- 41. Unrelated to the research areas of Ernst Mayr is
 - (1) Systematics
 - (2) Dendrology
 - (3) Evolution
 - (4) Zoogeography
- 42. Statement-I: In unicellular organisms, reproduction is synonymous with growth.

 Statement-II: In majority of higher animals and plants growth and reproduction are mutually exclusive events.
 - (1) Both Statement I and Statement II are correct
 - (2) Statement I is correct, Statement II is wrong
 - (3) S tatement I is w rong, S tatement II is correct
 - (4) Both Statement I and Statement II are wrong

- 43. *Ide*ntify the mismatch
 - (1) Cani dae Dogs
 - (2) Carni vora Dogs
 - (3) Polymoniales Convolvulaceae
 - (4) Primata Dogs
- 44. Study the following and identify the correct related to the diagram

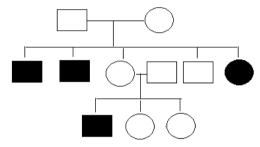


- (1) A denovirus
- (2) Causes respiratory infections
- (3) Nucleo protein
- (4) More than one option
- 45. The following is not related to LAB
 - (1) Play very beneficial role in checking disease causing microbes in human stomach
 - (2) Increase vitamin B_2
 - (3) Convert milk into curd
 - (4) None of the above
- 46. Streptomycin antibiotic is obtained from
 - (1) Streptomyces griseus
 - (2) Streptomyces nodosus
 - (3) Streptomyces fradiae
 - (4) Streptomyces kanamyceticus
- 47. *Monascus purpureus*
 - (1) Is \mathcal{U} nicellular eukaryote
 - (2) Eukaryotic heterotroph
 - (3) Belongs to Ascomycetes
 - (4) All the above
- 48. Identify the incorrect statement regarding sewage treatment
 - (1) Primary treatment is physical treatment
 - (2) Flocs are madeup of prokaryotic cells only
 - (3) Activated sludge contains both prokaryotic and eukaryotic cells
 - (4) The major part of activated sludge is pumped into anaerobic sludge digesters which contain anaerobic bacteria

- 49. *Identify* the correct match from the following with respect to biocontrol
 - (1) Ladybird mosquitoes
 - (2) Dragon flies Aphi ds
 - (3) Trichoderma Prokaryote
 - (4) Bacillus thuringiensis Butterfly

Cater pillers

- 50. Chlamydomonas, Chlorella, Paramoecium and Amoeba have common features except
 - (1) Belong to Protista kingdom according to Five-kingdom system
 - (2) \mathcal{U} nicellular nature
 - (3) Eukaryotic cell structure
 - (4) Nutritional habit
- 51. Study the pedigree chart given below



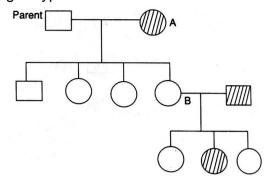
What does it show?

- (1) The pedigree chart is wrong as this is not possible
- (2) Inheritance of a condition like an autosomal recessive trait
- (3) Inheritance of a condition like an allosomal recessive trait belonged to Y chromosome
- (4) Inheritance of a sex-linked inborn error of metabolism
- 52. Read the following disorders
 - i. Short statured
 - ii. Big and wrinkled tongue
 - iii. Many loops on finger tips
 - iv. Partially open mouth

The above disorders are seen in

- (1) t_n isomy of 21
- (2) 47, XXY
- (3) 45, XO
- (4) t_{ri} somy of 18
- 53. Find the autosomal dominant trait in the following.
 - (1) Thalassemia
 - (2) Phenylketonuria
 - (3) Sickle-cell anaemia
 - (4) Myotonic dystrophy

54. The given pedigree shows inheritance of autosomal recessive disorder. What are the genotypes of A and B



- (1) Aa, AA
- (2) aa, AA
- (3) aa, Aa
- (4) Aa, aa
- 55. Suppose the terminal ends of an axon are in dose contact with dendrites of four adjacent neurons, the nerve impulse of the axon will
 - (1) travel in all the four neurons
 - (2) get distributed in all the four neurons resulting in weak impulse
 - (3) travel to only one neuron with the same intensity
 - (4) not travel to all the neurons because the impulse travels from axons of one neuron into the axon of another neuron
- 56. Cerebrospinal fluid circulates through all of the following, except
 - (1) corpus callosum
 - (2) third ventride
 - (3) fourth ventricle
 - (4) cerebral aqueduct
- 57. Immediately after an action potential is generated, which one of the following ions rapidly diffuse out of the axon into the tissue fluid
 - (1) potassium
 - (2) calcium
 - (3) sodium
 - (4) chloride
- 58. The nerve gas Sarin, an organophosphorus compound, used as a chemical weapon
 - (1) blocks the acetylcholine receptor sites
 - (2) inhibits acetyl cholinesterase
 - (3) inhibits the release of acetylcholine
 - (4) enhances the release of acetylcholine

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59. The neurotransmitter transmits the nerve impulse to the ---A---, by diffusing across the ---B--- and binding to receptor molecules on the ---C---

Identify A, B and C respectively

- (1) Pre-synaptic neuron; synaptic deft; post synaptic membrane
- (2) Post synaptic neuron; synaptic deft; presynaptic membrane
- (3) Post synaptic neuron; synaptic deft; post synaptic membrane
- (4) Pre-synaptic neuron; synaptic cleft; presynaptic membrane
- 60. When a neuron is not conducting any impulse, i.e., resting, the axonal membrane is comparatively more permeable to (p) and nearly impermeable to (q) ions

Choose the correct (p) and (q) ions

- (1) 𝒩a⁺; K⁺
- (2) K+; Na+
- (3) Ca⁺⁺: Na⁺
- (4) Na+; Ca++
- 61. Chemosynthetic autotrophic bacteria oxidize the following substances and use the released energy for their ATP production
 - (1) Ammonia
 - (2) Mitrites
 - (3) \mathcal{E} lemental sulphur
 - (4) All the above
- 62. Identify the incorrect regarding Euglena
 - (1) Shows metaboly
 - (2) Shows autotrophic nutrition only
 - (3) Contain chloroplasts
 - (4) Has two unequal flagella
- 63. The following is not a human parasitic protistan
 - (1) Amoeba
 - (2) Plasmodium
 - (3) Trypanosoma
 - (4) Entamoeba
- 64. A *rr*ange the following in a sequence that occur during somatogamy in fungi
 - A) Meiosis
- B) Plasmogamy
- C) Karyogamy
- D) Fusion of two vegetative cells
- (1) $D \rightarrow B \rightarrow C \rightarrow A$
- (2) $A \rightarrow C \rightarrow B \rightarrow D$
- (3) $D \rightarrow C \rightarrow B \rightarrow A$
- (4) $A \rightarrow B \rightarrow C \rightarrow D$

65. Identify the following diagram



- (1) Mucor
- (2) Aspergillus
- (3) Agaricus
- (4) Alternaria
- 66. Claviceps, Ustilago, Trichoderma, Albugo, Alternaria, Puccinia, Neurospora, Mucor, Aspergillus. How many fungi belong to sac fungi group?
 - (1) 3
 - $(2) \quad 2$
 - (3) 4
 - (4) 6
- 67. Incorrect regarding the prions is
 - (1) Prions are similar in size to viruses
 - (2) They cause neurological diseases
 - (3) \mathcal{N} ucleic aci d is a circular molecule
 - (4) Made up of only proteins
- 68. Study the following diagram and identify the correct statement



- (1) Filament with uniseriate
- (2) Belongs to chlorophyceae
- (3) Chloroplast is cup shaped
- (4) 1 and 2
- 69. *Ide*ntify the mismatch

		Green algae	B <i>r</i> own algae	Red algae
(1)	Pigments	Chl.a, b	Chl.a,c	Chl.a,d
(2)	Stored food	Starch	Mannitol, Lamina₁in	Flo <i>ri d</i> ean sta <i>r</i> ch
(3)	Flagella number	2-8	2	2
(4)	Cell wall	Cellul	Cellulose, Algin	Cellulose, Pectin, Polysulph ae esters

- 70. A) Bryophytes are most primitive embryophytes
 - B) In Bryophytes sporophytes are always non-photosynthetic
 - C) Marchantia shows dioecious sporophyte
 - D) Sporophyte depends on gametophyte physically and physiologically in Bryophytes
 - \mathcal{E}) All Bryophytes are homosporous How many statements are correct?
 - **(1)** 2
 - (2) 4
 - (3) 3
 - (4) 1
- 71. The sympathetic and parasympathetic nervous systems are subdivisions of the:
 - (1) Autonomic nervous system
 - (2) Voluntary nervous system
 - (3) Somatic nervous system
 - (4) Central nervous system
- 72. Which of the following is true about cretinism?
 - (1) It refers to severe hypothyroidism in an infant or child.
 - (2) It refers to severe hyperthy roid ism in an infant or child.
 - (3) It occurs in children due to hyposecretion of growth hormone
 - (4) It occurs in infants due to hypo parathyroidism during pregnancy of their mother
- 73. Which of the following hormones are secreted by hypothalamus and released from neurohypophysis?
 - (1) MSH and LH
 - (2) ADH and FSH
 - (3) GnRH and Oxytocin
 - (4) ADH and Oxytocin
- 74. In males, which of the following hormone stimulates the synthesis and secretion of androgens from testes?
 - (1) FSH
 - (2) ACTH
 - (3) LH
 - (4) T.SH
- 75. Which of the following hormones is a *derivative* of single amino aci *d*?
 - (1) *I*nsulin
 - (2) Cortisol
 - (3) Glucagon

- (4) \mathcal{E} pinephnine
- 76. Which of the following combinations of hormones promotes the production of erythrocytes?
 - (1) Cortisol; thy roxine; erythropoietin
 - (2) Catecholamines; glucagon; insulin
 - (3) Parathormone; thymosin; thyrocal citonin
 - (4) \mathcal{E} pinephrine; glucagon; thy roxine
- 77 Diabetes mellitus type-1 occurs due to:-
 - (1) hyposecretion of Vasopressin
 - (2) hyposecretion of insulin
 - (3) hypersecretion of insulin
 - (4) hypersecretion of antidiuretic hormone
- 78. Norepinephrine
 - a) is released by sympathetic fibres
 - b) is released by parasympathetic fibres
 - c) increases the heart rate
 - d) decreases blood pressure

Which of the above said statements are correct?

- (1) (a) and (d)
- (2) (a) and (c)
- (3) (b) an d (c)
- (4) (b) and (d)
- 79. During D \mathcal{N} A fingerprinting, separation of D \mathcal{N} A fragments is done by
 - (1) autoradiography
 - (2) in situ hybridisation
 - (3) chemical denaturation
 - (4) gel electrophoresis
- 80. Sequencing the whole set of genome that contained all the coding and non-coding sequences and later assigning different regions in the sequence with functions is known as
 - (1) Sequence annotation
 - (2) PCR
 - (3) Northern blotting
 - (4) *EST*
- 81. Root less, free floating hydrophyte, heterosporous and seedless plant is
 - (1) Azolla
 - (2) Salvinia
 - (3) Equisetum
 - (4) Selaginella
- 82. Common character between *Cycas* and *Pinus* is presence of
 - (1) Archegonia
 - (2) Naked seeds
 - (3) Symbiotic roots
 - (4) All the above

- 83. Unique feature of Angiosperms is
 - (1) $F_{r}uit$
 - (2) Double fertilization
 - (3) Triploid endosperm
 - (4) All the above
- 84. Identify the mismatch

Plant

Life cycle

- (1) Fucus
- Diplontic
- (2) Ectocarpus
- Haplodiplontic
- (3) Cycas
- Diplontic
- (4) Spirogyra
- Haplodiplontic
- 85. Common character between Bryophytes and Pteridophytes is
 - (1) Planogametes
 - (2) Female gametagium is Archegonium
 - (3) Zooi dogamous oogamy and chemotactic movement of male gametes
 - (4) All the above
- 86. As per the HGP, less than ______% of the genome codes for protein in human beings.
 - (1) 98%
 - (2) 50%
 - (3) 24%
 - (4) 2%
- 87. The number of base pairs in the human chromosome bearing TDF gene.
 - (1) 231 bp
 - (2) 14 bp
 - (3) 2968 bp
 - (4) 3000 bp
- 88. In this DNA fingerprint, the blood sample taken from a crime scene is not the victim's and so is assumed to be the perpetrator. Which individual is the best suspect?

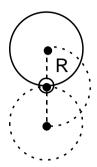
Blood stain	Rahim	Wasim	Jamal	Karim
		5-		
	5.			_
				_
	200 000			7.2

- (1) Rahim
- (2) Wasim
- (3) Jamal
- (4) Karim
- 89. How many locations have been identified in human genome where SNPs occur?
 - (1) 1.4 million
 - (2) 2.4 million
 - (3) 1.4 billion
 - (4) 2.4 billion
- 90. Strong magnetic fields along with non-ionising radiations are used in
 - (1) X-ray radiography
 - (2) **C**T
 - (3) $\mathcal{M}RI$
 - (4) EEG
- 91. A ring is rolling without slipping on a horizontal plane with velocity 'v' and acceleration a. The acceleration of point of contact is

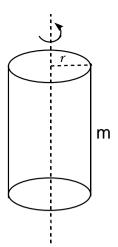


- (1) Horizontally towards right
- (2) Vertically upward
- (3) Vertically downward
- (4) Zero
- 92. A boy is standing on a disc rotating about the vertical axis passing through its centre. He pulls his arms towards himself reducing his moment of inertia by a factor 'm'. The new angular speed of the disc becomes double of its initial value. If the initial moment of inertia of the boy is 'Io' then moment of inertia of the disc will be
 - $(1) \quad \frac{2I_o}{m}$
 - $(2) \quad I_0 \left(1 \frac{2}{m}\right)$
 - $(3) \quad I_0 \left(1 \frac{1}{m} \right)$
 - (4) $\left(\frac{I_0}{2m}\right)$

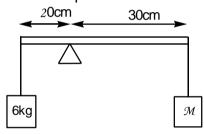
93. A ring is free to move in vertical plane about an axis passing through the circumference and perpendicular to its plane. When it is released from top most position, the angular speed of the centre of mass of the ring at the lowest position is



- $(1) \quad \sqrt{\frac{4g}{R}}$
- (2) $\sqrt{\frac{2g}{R}}$
- (3) $\sqrt{\frac{g}{R}}$
- $(4) \quad \sqrt{\frac{g}{2R}}$
- 94. A body of mass 'M' is moving on a circular track of radius 'r' in such a way that its kinetic energy 'k' depends on the distance travelled by the body 's' according to relation $k = \beta s$, where β is a constant. The angular acceleration of the particle is
 - $(1) \quad \frac{\beta r}{M^2}$
 - (2) $\sqrt{\frac{\beta r}{M}}$
 - $(3) \quad \frac{Mr^2}{\beta}$
 - (4) $\frac{\beta}{Mr}$
- 95. A solid cylinder of mass 'm' and radius 'r' is rotating about its axis with a constant angular speed. If speed of a particle at circumference is V, then the rotational kinetic energy of the cylinder is

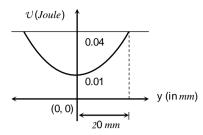


- $(1) \quad \frac{1}{4}mv^2$
- $(2) \quad \frac{1}{2}mv^2$
- $(3) \quad \frac{3}{4}mv^2$
- (4) mv^2
- 96. The value of \mathcal{M} , as shown, for which the light rod will be in equilibrium is



- (1) 1 kg
- (2) 2 kg
- (3) 4 kg
- (4) 6 kg
- 97. A particle in $\mathcal{S}.H.\mathcal{M}$. is described by the displacement function $x(t) = a\cos(\omega t + \theta)$. If the initial (t=0) position of the particle is 1 cm, initial velocity is $\pi \, cm/s \, and$ the angular frequency is $\pi \, rads^{-1}$, then it's amplitude is
 - (1) 1 *cm*
 - (2) $\sqrt{2}$ cm
 - (3) 2 cm
 - (4) 2.5 cm
- 98. A particle executes simple harmonic motion with a frequency f. The frequency with which its kinetic energy oscillates is
 - (1) f/2
 - (2) f
 - (3) 2f
 - **(4)** 4*f*

99. The variation of potential energy of harmonic oscillator is as shown in figure. The spring constant is



- (1) 100 *N/m*
- (2) 150 N/m
- (3) 667*N/m*
- (4) 300 N/m

100. When a body of mass 1.0 kg is suspended from a certain light spring hanging vertically, its length increases by 5 cm. By suspending 2.0 kg block to the spring and if the block is pulled through 10 cm and released then the maximum acceleration in it in ms^2 is:

 $(g = 10m/s^2)$

- (1) 10
- (2) 1
- (3) 20
- (4) 0.1

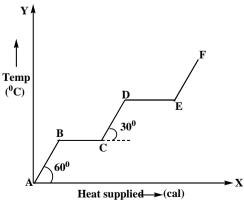
101. Instantaneous acceleration (in ms²) of a particle executing $\mathcal{S}.H.\mathcal{M}$ is given by π (π π)

$$a = -\frac{\pi}{4} \sin\left(\frac{\pi}{4}t - \frac{\pi}{6}\right)$$
. The maximum speed

of the particle will occur first time at

- (1) 1.75 s
- (2) 1.4 s
- (3) 1.2 s
- (4) 0.67 s

102. A source of heat supplies heat at a constant rate to a solid cube. The variation of the temperature of the cube with heat supplied is shown in fig.



(1) The thermal capacity of the solid is three times of the liquid

- (2) The specific heat of the vapour is three times that of the liquid
- (3) The latent heat of vaporization of the liquid is two times the latent heat of fusion of the solid
- (4) Thermal capacity of liquid is 3 times that of the solid

103. A given mass of a gas is allowed to expand isobarically until its volume becomes double. If C_b and C_a are the velocities of sound in this gas before and after expansion respectively, then C_a is equal to

- (1) $2C_{b}$
- (2) $\sqrt{2} C_h$
- (3) *C*_b
- (4) $\frac{1}{\sqrt{2}}C_b$

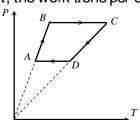
104. The following sets of values for C_V and C_P of a gas has been reported by different students. The units are cal/gm-mole-K. Which of these sets is most reliable

- (1) $C_v = 3, C_p = 5$
- (2) $C_V = 4, C_P = 6$
- (3) $C_v = 3, C_p = 2$
- (4) $C_V = 3, C_P = 4.2$

105. A monoatomic gas at $27^{\circ}C$ is suddenly compressed such that its pressure becomes $\frac{1}{32}$ of original pressure. RMS velocity of the gas molecules will be

- (1) same
- (2) halved
- (3) doubled
- (4) fourtimes

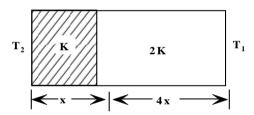
106. Six moles of an ideal gas perfomrs a cycle shown in figure. If the temperature are $T_A = 600 \ K$, $T_B = 800 \ K$, $T_C = 2200 \ K$ and $T_D = 1200 \ K$, the work done per cycle is nearly



- (1) 20 Kj
- $(2) \qquad 30 \, kJ$
- $(3) \quad 40 \, kJ$
- (4) 60 Kj

- 107. A Carnot engine whose low temperature reservoir is at 7°C has an efficiency of 50%. It is desired to increase the efficiency to 60%. By how many degrees should the temperature of the high temperature reservoir be increased
 - (1) 700 K
 - (2) 280 K
 - (3) 560 K
 - (4) 140 *K*
- 108. For cooking the food, which of the following type of utensil is most suitable
 - (1) High specific heat and low conductivity
 - (2) High specific heat and high conductivity
 - (3) Low specific heat and low conductivity
 - (4) Low specific heat and high conductivity
- 109. \mathcal{T} emperature of the two outer surfaces of a composite slab, consisting of two materials having coefficients of thermal conductivity K and 2K, thickness X and 4X respectively are \mathcal{T}_2 and \mathcal{T}_1 ($\mathcal{T}_2 > \mathcal{T}_1$). The rate of heat transfer through the slab, in a steady state is,

$$\left(\frac{\left(T_2-T_1\right)KA}{X}\right)f$$
 with f equal to



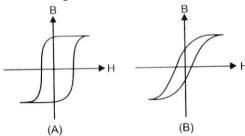
- (1)
- (2) $\frac{1}{2}$
- (3) $\frac{2}{3}$
- (4) $\frac{1}{3}$
- 110. In the spectrum of a black body at two temperature \mathcal{T}_1 and \mathcal{T}_2 , let A_1 and A_2 be the areas under the two curves respectively. The value of $A_1:A_2=1:16$. The ratio of wave lengths corresponding to maximum intensities at \mathcal{T}_1 and \mathcal{T}_2 is
 - (1) 1:16
 - (2) 4:1
 - (3) 2:1
 - (4) 16: 1

- 111. \mathcal{T} wo identical containers each of volume V_0 are joined by a small pipe. \mathcal{T} he containers contain identical gases at temperature \mathcal{T}_0 and pressure P_0 . One container is heated to temperature $2\mathcal{T}_0$ while the other at the same temperature. \mathcal{T} he no of moles of the gas in container at temperature $2\mathcal{T}_0$ is
 - (1) $\frac{2P_0V_0}{3RT_0}$
 - $(2) \quad \frac{3P_0V_0}{2RT_0}$
 - $(3) \quad \frac{2P_0V_0}{RT_0}$
 - (4) $\frac{P_0V_0}{3RT_0}$
- 112. When plane of a dip circle is along magnetic meridian, period of oscillation of dip needle is \mathcal{T}_1 . When plane of dip circle is perpendicular to the magnetic meridian, the period of oscillation is \mathcal{T}_2 then $\frac{T_1}{T_2}$ is (Angle of dip =

30⁰)

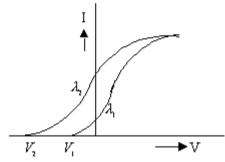
- (1) $\sqrt{2}$
- (2) 1
- (3) $\sqrt{3}$
- (4) $\frac{1}{\sqrt{2}}$
- 113. When a substance is kept in a magnetic fiel *d*, it gets *r*epelle *d*. Which of the following *r*ep*r*esents its susceptibility?
 - (1) -0.0004
 - (2) 0.0004
 - (3) 1.000
 - (4) -1.000
- 114. A paramagnetic sample shows a net magnetisation of $8Am^{-1}$ when place d in an external magnetic fiel d of 0.6T at a temperature of 4K. When the same sample is place d in an external magnetic fiel d of 0.2T at a temperature of 16K, the magnetisation will be
 - (1) $\frac{32}{3}Am^{-1}$
 - (2) $\frac{2}{3}Am^{-1}$
 - (3) $6Am^{-1}$
 - (4) $2.4Am^{-1}$

- 115. The primary origin(s) of magnetism lies in
 - a) atomic currents
 - b) Pauli exclusion principle
 - c) polar nature of molecules
 - d) intrinsic spin of electron
 - (1) a and d
 - (2) b an d d
 - (3) c an d d
 - (4) all the given
- 116. Hysteresis loops for two magnetic materials A and B are given below:



These materials are used to make magnets for electric generators, transformer core and electromagnet core. Then it is proper to use

- (1) A for electric generators and transformers
- (2) A for electromagnets and B for electric generators
- (3) A for transformers and B for electric generators.
- (4) B for electromagnets and transformers
- 117. In stopping potential (V) versus photo current
 - (1) graph, if $V_2 > V_1$ then compare the wavelengths of incident radiations on a metal

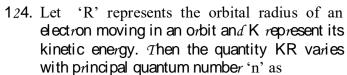


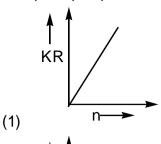
- $(1) \qquad \lambda_1 = \sqrt{\lambda_2}$
- (2) $\lambda_1 < \lambda_2$
- (3) $\lambda_1 = \lambda_2$
- (4) $\lambda_1 > \lambda_2$
- 118. When energy of incident radiation is increased by 20%, the kinetic energy of most energetic electrons is increased from 0.80 eV to 1.10 eV. The work function of metal is

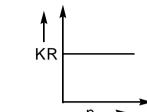
- (1) 0.3 eV
- (2) 0.5 eV
- (3) 0.7 eV
- (4) 0.9 eV
- 119. In certain metal violet light can cause photoelectric emission but blue light cannot. If sodium light is incident on the metal, then
 - (1) \mathcal{M} aximum kinetic energy of electrons increases
 - (2) Photoelectric current increases
 - (3) Photoelectric emission does not occur
 - (4) Photoelectric current decreases
- 120. de Broglie wavelength associated with the orbital electron in nth orbit of hydrogen atom is approximately given by
 - (1) (4.4n²)°A
 - (2) $(2.2n^2)^{\circ}A$
 - (3) (3.3n)°A
 - (4) (4.4n)°A
- 121. The angular momentum of an electron in H-atom is $\frac{h}{\pi}$, where 'h' is Planck's constant. The

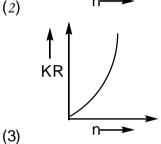
kinetic energy of the electron is

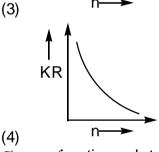
- (1) 13.6 eV
- (2) 3.4 eV
- (3) 6.8 e V
- (4) 27.2 eV
- 122. In a hypothetical Bohr hydrogen, the mass of the electron is doubled. The energy \mathcal{E}_0 and the radius r_0 of the first orbit will be (a₀ is the Bohr radius)
 - (1) $E_0 = -27.2 \text{ eV}; r_0 = a_0 / 2$
 - (2) $E_0 = -27.2 \text{ eV}; r_0 = a_0$
 - (3) $E_0 = -13.6 \text{ eV}; r_0 = a_0 / 2$
 - (4) $E_0 = -13.6 \ eV; r_0 = a_0$
- 123. The difference between (n+1)th Bohr radius and nth Bohr radius is equal to the (n-1)th Bohr radius. The value of 'n' is
 - (1) 3
 - (2) 4
 - (3) 5
 - (4) 6











125. Two radioactive substances A and B have decay constants such that $\lambda_A = 2\lambda_B$. At t = 0, number of nuclei of 'B' is twice of that of A. Then after what time, the ratio of number of nuclei of A to that of number of nuclei of B is

$$\frac{1}{2e}$$
?

- $(1) \quad \frac{1}{2\lambda_B}$
- (2) $\frac{1}{\lambda_A}$
- (3) $\frac{2}{\lambda_B}$
- $(4) \quad \frac{1}{\lambda_B}$
- 126. A nucleus of mass 'M' is at rest. An alpha particle of mass 'm' is emitted from the nucleus with momentum P,Q value of the nuclear reaction is

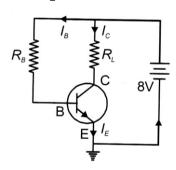
$$(1) \quad \frac{P^2M}{2m(M+m)}$$

$$(2) \quad \frac{P^2 m}{2M \left(M+m\right)}$$

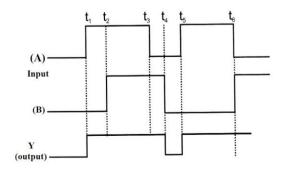
$$(3) \quad \frac{P^2M}{2m(M-m)}$$

$$(4) \quad \frac{P^2m}{2M(M-m)}$$

- 127. To generate a power of 3.2 megawatt, the number of fissions of \mathcal{U}^{235} per minute is (£nergy released per fission = 200 MeV, $1eV=1.6x10^{-19}J$)
 - (1) 6×10^{18}
 - (2) 6×10^{17}
 - $(3) 10^{17}$
 - (4) 6×10^{16}
- 128. For an n-p-n transistor as shown in circuit, $I_{\rm C}=4{\rm mA},\ {\rm V}_{\rm C\#}=4{\rm V}, {\rm V}_{\rm B\#}=0.6{\rm V}$ and $\beta_{\rm dc}=100$. The value of R_L is

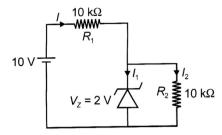


- (1) $1 k\Omega$
- (2) $2 k\Omega$
- (3) $3k\Omega$
- (4) $4 k\Omega$
- 129. *Ide*ntify the logic gate which follows the following input-output waveform



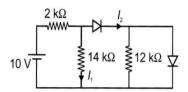
- (1) OR gate
- (2) AMD gate
- (3) $\mathcal{N}O\mathcal{T}$ gate
- (4) XOR gate

130. Current *I*₁ through the Zener *d*io*d*e shown in the circuit is



- (1) Zero
- (2) 0.6 Ma
- (3) 0.2 mA
- (4) 0.8 mA

131. In the circuit shown, l_1 and l_2 are respectively (If diodes are ideal)



- (1) 0,0
- (2) 5 mA, 5 mA
- (3) 5 mA, 0
- (4) 0,5 mA

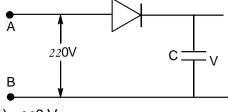
132. Two particles A and B moving in opposite directions have de-Broglie wavelengths λ₁ and λ₂ respectively. If they under go a perfectly inelastic collision to form a particle C then the de-Broglie wavelength of 'C' is

- $(1) \quad \frac{\lambda_1 \lambda_2}{\lambda_1 + \lambda_2}$
- (2) $\lambda_1 + \lambda_2$
- (3) $\lambda_1 \lambda_2$
- $(4) \quad \frac{\lambda_1 \lambda_2}{\lambda_1 \lambda_2}$

133. The ratio of the energies of a moving particle and a photon is 1/100. If their velocities are in the ratio 1/10 then the ratio of their de-Broglie wavelengths is

- (1) 5:1
- (2) 1:5
- (3) 10:1
- (4) 1:10

134. A 220V AC supply is connected between points A and B (figure). What will be the potential difference V across the plates of capacitor?



- (1) 220 V
- (2) 110 V
- (3) 0 V
- (4) $220\sqrt{2V}$

135. The gravitational force between a H-atom and another particle of mass m will be given by

Newton's law $F = G \frac{M \cdot m}{r^2}$, where 'r' is in

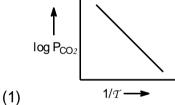
km and

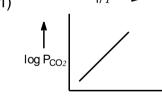
- (1) $M = m_{proton} + m_{electron}$
- (2) $M = m_{proton} + m_{electron} \frac{B}{c^2} (where B = 13.6eV)$
- (3) M is not related to the mass of the hydrogen atom

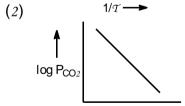
(4)
$$M = m_{proton} + m_{electron} - \frac{|V|}{c^2}$$

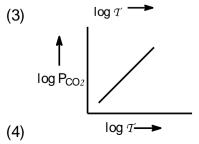
(here |V| is magnitude of the potential energy of electron in the H-atom)

136. For the chemical equilibrium $CaCO_3$ (s) \rightleftharpoons $CaO(s) + CO_2(g) \setminus \Delta H^0$ can be determined from which one of the following graphs?









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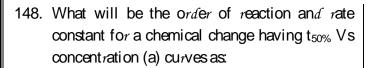
- 137. The solubility of CaF₂ ($K_{sp} = 3.4 \times 10^{-11}$) in 0.1% NaF would be:
 - (1) 2.4×10^{-6}
 - (2) 3.4 × 10⁻⁹
 - $(3) 1.4 \times 10^{-11}$
 - (4) 0.4×10^{-12}
- 138. pOH of H₂O at 298 K is 7.0. What will be the pOH. If water is heated to 357 K
 - (1) p(OH) will be more than 7.0
 - (2) p(OH) will be less than 7.0
 - (3) p(OH) will be seven
 - (4) None of these
- 139. If the equilibrium constant of the reaction of weak acid HA with strong base is 109 then pH of 0.1 M NaA is:
 - (1) 5
 - (2) 9
 - (3) 7
 - (4) 8
- 140. K_P of a reaction at 300 K is 6 atm and 2 atm at 450 K. Which of the statement is incorrect about this reaction, if $\Delta n = 1$?
 - (1) The reaction is exothermic
 - (2) Backward reaction is endothermic
 - (3) $\mathcal{E}_{a}^{f} > \mathcal{E}_{a}^{b}$
 - (4) The difference between heat of reaction at constant pressure and that at constant volume is RT
- 141. Solubility of Calcium phosphate (molecular mass, \mathcal{M}) in water is W g per 100 mL at 25°C. Its solubility product at 25°C will be approximately:
 - (1) $1.08 \times 10^9 \left(\frac{W}{M}\right)^5$
 - $(2) \quad 1.08 \times 10^7 \left(\frac{W}{M}\right)^5$
 - (3) $1.08 \times 10^5 \left(\frac{W}{M}\right)^5$
 - (4) $1.08 \times 10^3 \left(\frac{W}{M}\right)^5$
- 142. If 50 ml of 0.2 \mathcal{M} KOH is added to 40 ml of 0.5 \mathcal{M} HCOOH The pH of the resulting solution is (Ka = 2×10^{-4})
 - (1) 3.7
 - (2) 5.6

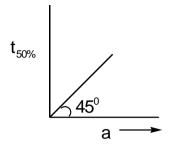
- (3) 7.5
- (4) 10.25
- 143. <u>Statement I</u>: Addition of an inert gas at constant pressure for the dissociation equilibrium of $PCl_s(g) \Leftrightarrow PCl_s(g) + Cl_s(g)$ favours forward reaction.

<u>Statement II</u>: A ddition of an inert gas at constant volume has no effect on the equilibrium position in the reaction

$$PCl_5(g) \Leftrightarrow PCl_3(g) + Cl_2(g)$$
.

- (1) Statement I an d statement II are true.
- (2) Statement I and d statement II are false.
- (3) Statement I is true, statement II is false
- (4) Statement I is false statement II is true
- 144. The K_P of a reaction is 10 atm⁻² at a temperature T on Kelvin scale. Hence,
 - (1) $K_p = K_c$
 - (2) $K_P < K_C$
 - $(3) K_{P} > K_{C}$
 - (4) Can't be predicted
- 145. The value of ΔG° for a reaction in aqueous phase having $K_c = 1$, woul d be
 - (1) 2.303 RT
 - (2) 1
 - (3) 0
 - (4) + 2.303 RT
- 146. The rate constant of the reaction: $2H_2O_{2(aq)} \rightarrow 2H_2O_{(1)} + O_{2(g)}$ is $3\times 10^{-3}\,\mathrm{min}^{-1}$. At what concentration H_2O_2 the rate of the reaction will be $2\times 10^{-4}\,\mathrm{M}/\mathrm{sec}$.
 - (1) $6.67 \times 10^{-3} \mathcal{M}$
 - (2) 2M
 - (3) $4\mathcal{M}$
 - (4) $0.08 \, \mathcal{M}$
- 147. For a first order reaction $X(g) \rightarrow Y(g) + Z(g)$, the half life period is 10min. In what period of time would the concentration of 'X' be reduced to 10% of original concentration?
 - (1) 33 min
 - (2) 22 min
 - (3) 10 min
 - (4) 25.2 min





- (1) 0, ½
- (2) 1, 1
- (3) 2, 2
- (4) 3, $\frac{1}{2}$
- 149. A catalyst lowers the activation energy of a reaction from 20 KJ/mol to 10 KJ/mol. The temperature at which the uncatalyzed reaction will have the same rate as that of the catalyzed

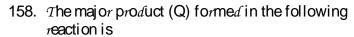
at 27° C is __ (assume that 'A' remains same for both reactions)

- $(1) -153^{\circ}C$
- (2) 327° C
- (3) 32.7° C
- (4) 500° C
- 150. Which of the following statements is not t_r ue about the hexagonal close packing?
 - (1) The coordination number is 12
 - (2) It has 74% packing efficiency
 - (3) Tetrahedral voids of the second layer are covered by the spheres of the third layer
 - (4) In this arrangement spheres of the fourth layer are exactly aligned with those of the first layer
- 151. Statement-I Schottky defect is generally shown by the compounds with high coordination number

 \mathcal{S} tatement-II: In \mathcal{S} chottky defect, unequal number of cations an d anions are missing from the lattice sites

- (1) S tatement-I an d statement-II are true
- (2) Statement-I is t_r ue but statement-II is False
- (3) Statement-I is false but statement-II is True

- (4) \mathcal{S} tatement-I and statement-II are false
- 152. When NaCl crystals are heated in an atmosphere of sodium vapour, sodium chloride crystals impart yellow colour. This is due to
 - (1) Impurity defect
 - (2) Schottky defect
 - (3) metal excess defect
 - (4) metal deficiency defect
- 153. A metal has fcc lattice and its edge length is 404pm. Find the molar mass of metal, if its density is 2.72g/cc.
 - (1) 27g/mol
 - (2) 20g/mol
 - (3) 35g/mol
 - (4) 56g/mol
- 154. Optically inactive amino aci d is
 - (1) Glycine
 - (2) Leucine
 - (3) Arginine
 - (4) Iso Leucine
- 155. Maltose on hydrolysis gives
 - (1) $\alpha \cdot D(+)$ Glucose+D(-) Fructose
 - (2) $\alpha D(+)$ and $\beta D(+)$ Glucose
 - (3) Only $\alpha D(+)$ Glucose
 - (4) Only $\beta D(+)$ Glucose
- 156. W_r ong statement given below is
 - Vitamin-A deficiency causes Xerophthalmia.
 - (2) Vitamin-Thymine deficiency causes wet and dry Beri-Beri disease.
 - (3) Vitamin-Pyridoxine deficiency causes Osteomalacia
 - (4) Vitamin-C deficiency causes bleeding gums.
- 157. Test with the following reagent is used to detect the presence of primary alcoholic group in D-glucose.
 - (1) HNO_3
 - (2) Br_2 water
 - (3) Tollen's reagent
 - (4) A cetic anhy dri de/py ri dine



$$2 \underbrace{\bigcirc \qquad}_{+ \text{ CC}l_3\text{CHO}} \xrightarrow{\text{conc. H}_2\text{SO}_4} Q$$

(3)

(4)

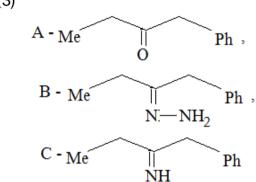
159. The products A, B, C in the following reaction

$$\begin{array}{c|c}
Me & \xrightarrow{Ph} & \xrightarrow{PCC} A & \xrightarrow{H_2N - NH_2} B \\
& \xrightarrow{KOH} & C & & & \\
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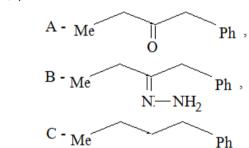
(1)

(2)

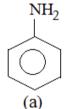
(3)



(4)

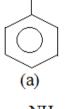


160. Which of the following options correctly represent the basicity of the following compounds.

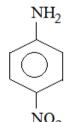


$$\mathcal{C}$$

 NH_2



$$\bigcup_{\text{(b)}} NO_2$$



- CH_3 (d)
- (1) a > b > c > d
- (2) d > a > b > c
- (3) c > b > d > a
- d > c > b > a

Sri Chaitanya

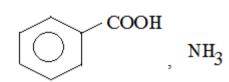
- 161. Which product of the following reactions Fails to give carbylamine test?
 - (1) Hoffman bromami de degradation
 - (2) Gabriel pthalimide synthesis
 - (3) Reduction of nitriles with $LiAlH_4$
 - (4) Reduction of isocyani des with $LiAlH_4$
- 162. Identify A and B in the following reaction.

$$\begin{array}{ccc}
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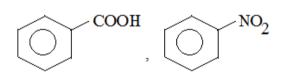
(1)

$$\bigcirc^{\text{CH}_2-\text{NO}_2}$$

(2**)**



(3)



NH₂OH

(4)

163. What is the possible product 'P' in the following reaction?

$$\begin{array}{c|c}
O & O \\
H & \underline{NaOH} \\
O \\
O \\
(1)
\end{array}$$

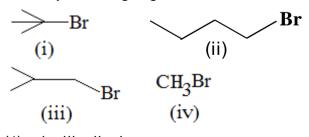
164. From the following identify the reactions that give alcohol as the product.

a)
$$CH_2 \xrightarrow{\text{(i) } B_2H_6} \xrightarrow{\text{H}_2O_2 / \text{aq. NaOH}}$$

b)
$$\xrightarrow{\text{COOMe}} \xrightarrow{\text{H}_2/\text{Catalyst}}$$

$$\begin{array}{c}
O \\
NaBH_4 \\
\hline
MeOH
\end{array}$$

- (1) a, b, c, d
- (2) b, c, d only
- (3) a, b, c only
- (4) a, b, d only
- 165. A rrange the following bromi des in the order of reactivity in undergoing SN^{I} reaction



- $(1) \quad i > iii > ii > iv$
- (2) iv > ii > iii > i
- (3) i > ii > iii > iv
- (4) ii > iv > iii > i

166. $CH_3 - Br + AgF \rightarrow H_3C - F + AgBr$.

This reaction is called as

- (1) Sandmeyer reaction
- (2) Williamsons synthesis
- (3) Finkelstein reaction
- (4) Swarts reaction

Phenol \xrightarrow{NaOH} P $\xrightarrow{CO_2}$ Q $\xrightarrow{CH_3CO_2O}$ R

Here 'R' is

- (1) antibiotic
- (2) antiseptic
- (3) analgesic
- (4) tranquiliser

168. $A \xrightarrow{C_2 H_5 MgI} X \xrightarrow{H^{\square}/H_2 O}$

Ter-amyl alcohol. The compound 'A' in the above sequence of reaction is

- (1) acetone
- (2) acetal dehy de
- (3) 2-butanone
- (4) propanal
- 169. The intermediate formed in Reimer Tiemann reaction

$$CH_2 \square OH$$
(3)

(4)

170. Identify incorrect statement:

- (1) Chloroform is used in the production Of Freon refrigerant R 22
- (2) \mathcal{U} nder the name of pyrene trichloromethane is used as fire \mathcal{E} xtinguisher
- (3) Antiseptic property of iodoform is due to the releasing of free I,
- (4) Freon 12 is manufactured from tetrachloromethane by Swarts reaction
- 171. Hydration of propene in presence of dilute sulphuric acid gives 'x' and hydroboration oxidation of propene gives 'y'. The correct statements about x and y are:

I = x and y are positional isomers

 Π = Formation of 'x' involves Markonikov's rule and the formation of y' follows Antimarkonikov's rule.

III = x and y are homologues IV = Both x and y contain same functional group

- (1) AII
- (2) I, II, III
- (3) I, III only
- (4) *I, II, I*V
- 172. $CH_3COOH + C_2H_5OH = 6000$

Products. The correct set of products in the reaction is

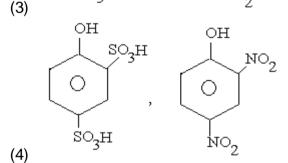
- (1) $CH_3COO_2^{18}H_5 + H_2O$
- (2) $CH_3C \overset{18}{O}OC_2H_5 + H_2O$
- (3) $CH_3COOC_2H_5 + H_2O^{18}$
- (4) $CH_3COO_2^{18}H_5 + H_2O_2^{18}$

(2)

What are x and y?

(1)

OH NO₂ OH NO₂
O NO₂



174. Among the following which can't be prepared by williamson's synthesis?

$$I.(CH_3)_3 C-O-C(CH_3)_3$$

III. CH₃-O-C₂H₅

- (1) I, II
- (2) II, III
- (3) *I*, *III*
- (4) only III
- 175. The incorrect statement's are
 - A) In £tard reaction toluene converted into Benzal dehy de
 - B) In Stephen reaction ethane nitrile converted into acetal dehy de

- C) In Gatterman Koch reaction Toluene converted into Benzal dehy de
- D) Benzal dehy de is more reactive than propanal towards nucleophilic addition
- (1) A&B only
- (2) B&C only
- (3) C&D only
- (4) D&A only
- 176. Which product is not formed in cross aldol condensation of mixture of ethanol and propanal
 - (1) But 2-enal
 - (2) Pent-2-enal
 - (3) 2-methyl -but-2-enal
 - (4) 2-methyl-pent-1-enal
- 177. Identify the correct statement
 - (1) Mitriles are strong bases than amines
 - (2) Cyani des boil at higher temperature than their isomeric isocyani des
 - (3) In the preparation of cyanides from aldoximes acetic anhydride is used, which act as acetylating agent
 - (4) Alkyl isocyaniaes on oxidation with HgO produces alkyl isothiocyanate
- 178. In the sequence of reactions,

$$CH_3CH_2I \xrightarrow{NaCN} A \xrightarrow{OH^-} B \xrightarrow{Br_2NaOH} C$$
.

The major product C is

- (1) CH_3CH_2 -CO- $\mathcal{M}HB_r$
- (2) CH_3CH_2 -CO- $\mathcal{N}Br_2$
- (3) CH_3CH_2 -COO- $\mathcal{N}H_4$
- (4) CH_3CH_2 - $\mathcal{M}H_2$
- 179. Direct nitration of aniline gives ortho, para and meta nitro aniline. The correct order of yield is:
 - (1) ortho > meta > para
 - (2) ortho = meta = para
 - (3) para > meta > ortho
 - (4) meta > para > ortho
- 180. Carbyl amine test is answered by
 - (1) Isopropyl amine
 - (II) Ethyl dimethyl amine
 - (III) Tertiary butyl amine
 - (N) Benzene amine
 - (1) *I*, *III* only
 - (2) II, III, IV
 - (3) *I, III, I*V
 - (4) III, IV only

Sri Chaitanya Page 20 Educational Institutions



SRI CHAITANYA EDUCATIONAL INSTITUTIONS,INDIA

A.P,TELANGANA,KARNATAKA,TAMILNADU,MAHARASHTRA,DELHI,RANCHI SR ELITE Date: 26.03.19

NEET UNIT TEST - 2 KEY

BIOLOGY

1) 3	2) 1	3) 4	4) 3	5) 1	6) 3	7) 3	8) 1	9) 4	10) 3
11) 4	12) 4	13) 1	14) 1	15) 2	16) 1	17) 4	18) 2	19) 2	20) 2
21) 3	22) 1	23) 2	24) 1	25) 3	26) 4	27) 3	28) 1	29) 1	30) 4
31) 2	32) 3	33) 4	34) 3	35) 2	36) 2	37) 2	38) 3	39) 1	40) 2
41) 2	42) 1	43) 4	44) 4	45) 2	46) 1	47) 4	48) 2	49) 4	50) 4
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61) 4	62) 2	63) 1	64) 1	65) 2	66) 1	67) 3	68) 4	69) 3	70) 3
71) 1	72) 1	73) 4	74) 3	75) 4	76) 1	77) 2	78) 2	79) 4	80) 1
81) 2	82) 4	83) 4	84) 4	85) 4	86) 4	87) 1	88) 3	89) 1	90) 3

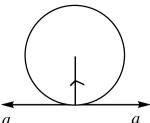
PHYSICS

91)	2	92)	2	93)	2	94)	4	95)	1	96)	3	97)	2	98)	3	99)	2	100)	1
101)	4	102)	4	103)	2	104)	1	105)	2	106)	3	107)	4	108)	4	109)	4	110)	3
111)	1	112)	4	113)	1	114)	2	115)	1	116)	4	117)	4	118)	3	119)	3	120)	3
121)	2	122)	1	123)	2	124)	2	125)	4	126)	3	127)	1	128)	1	129)	1	130)	2
131)	4	132)	4	133)	1	134)	4	135)	2									•	

CHEMISTRY

136)	1	137)	2	138)	2	139)	2	140)	3	141)	2	142)	1	143)	1	144)	2	145)	3
146)	3	147)	1	148)	1	149)	2	150)	4	151)	2	152)	3	153)	1	154)	1	155)	3
156)	3	157)	1	158)	4	159)	4	160)	2	161)	4	162)	2	163)	2	164)	3	165)	1
166)	4	167)	3	168)	1	169)	2	170)	2	171)	4	172)	1	173)	3	174)	1	175)	3
176)	4	177)	2	178)	4	179)	3	180)	3			•		•		•		•	

SOLUTIONS PHYSICS



91.
$$a_{cm} = r \propto \Rightarrow a_{horizontal} = 0$$
$$\Rightarrow a_{net} = a_{cn}$$

92.
$$(I_o + I_d)\omega = \left(\frac{I_o}{m} + I_d\right)2\omega$$

$$I_d = I_0 \left(1 - \frac{2}{m}\right)$$

93.
$$PE_{lost} = KE_{gained}$$

$$mg \ 2R = \frac{1}{2} (2mR^{2}) w^{2}$$

$$w = \sqrt{\frac{2g}{R}}$$
94.
$$K = \beta s$$

$$\frac{1}{2}mv^{2} = \beta s$$

$$\frac{1}{2}m2v\frac{dv}{dt} = \beta \left(\frac{dS}{dt}\right)$$

$$a_T = \frac{\beta}{m} \Rightarrow r_\alpha = \frac{\beta}{m}$$

95.
$$V = r\omega \Rightarrow \omega = \frac{v}{r}$$

$$KE = \frac{1}{2}I\omega^2 = \frac{1}{2}\frac{mr^2}{2}\left(\frac{v^2}{r^2}\right) = \frac{1}{4}mv^2$$

96.
$$mg \times 30 = 6g \times 20 \Rightarrow m = \frac{6 \times 20}{30} = 4kg$$

97.
$$1 = a \cos \theta - - - (1)$$
$$\pi = aw \cos \theta$$
$$\Rightarrow 1 = a \sin \theta - - - (2)$$

$$a^2 \sin \theta + a^2 \cos \theta = 2 \Rightarrow a = \sqrt{2}$$

99.
$$\frac{1}{2}kA^{2} = (0.04 - 0.01)J$$
$$\frac{1}{2} \times k (2 \times 10^{-2})^{2} = 0.03$$
$$K = \frac{3 \times 10^{-2}}{2 \times 10^{-4}} = 150Nm^{-1}$$

100.
$$K = \frac{1 \times 10}{5 \times 10^{-2}} = 200 N m^{-1}$$
$$a_{\text{max}} = A w^2 = A \left(\sqrt{\frac{K}{m}} \right)^2 = 0.1 \left(\frac{100}{1} \right) = 10$$

101. Speed is maximum at mean position where acceleration is zero $\frac{\pi}{4}t = \frac{\pi}{6} \Rightarrow t = \frac{2}{3}s$

102.
$$Slope = \frac{\Delta \theta}{Q} = \frac{1}{ms}$$

$$\frac{H_{solid}}{H_{liquid}} = \frac{\tan 60}{\tan 30}$$

103. At constant P, $V \propto T \Rightarrow T_a = 2T_b$ But velocity of soun $d = \sqrt{\frac{\gamma RT}{M}}$ $\Rightarrow \frac{C_a}{C} = \sqrt{\frac{T_a}{T}} = \sqrt{\frac{2}{1}}$

$$\Rightarrow \frac{\sigma_a}{C_b} = \sqrt{\frac{a}{T_b}} = \sqrt{\frac{a}{1}}$$

$$C_a = \sqrt{2} C_b$$

104.
$$C_V = \frac{f}{2}R = f \ cal \ / \ gmole - K$$

$$C_P = \left(\frac{f}{2} + 1\right)R = \left(f + 2\right)cal \ / \ mol - K$$

105.
$$TP^{\frac{1-\gamma}{\gamma}} = cons \tan t$$

$$TP^{\frac{-2}{5}} = T_2 \left(\frac{P}{32}\right)^{\frac{-2}{5}}$$

$$T_1 = T_2 32^{\frac{2}{5}} \Rightarrow T_2 = \frac{T_1}{4}$$
and $C = \sqrt{\frac{\gamma RT}{M}}$

106.
$$dW_{AB} = dW_{CD} = 0$$

 $dW_{BC} = nRdT_1 \text{ and } dW_{DA} = nRdT_2$
 $dW_{net} = 6 \times 8.314(1400 - 600)J = 40kJ$

107.
$$\eta = 1 - \frac{T_2}{T_1} \Rightarrow \frac{1}{2} = -\frac{280}{T_1}$$

$$T_1 = 560K$$

$$\frac{60}{100} = 1 - \frac{280}{T_1^1} = 700K$$

$$\Delta T_1 = 140K$$

109.
$$R = R_1 + R_2$$

$$\frac{5x}{K_{eff}A} = \frac{x}{KA} + \frac{4x}{2KA}$$

$$K_{ef} = \frac{5}{3}K$$

$$\left(\frac{dQ}{dt}\right) = \frac{5}{3}K\frac{A(T_2 - T_1)}{5x}$$

110.
$$\frac{T_1}{T_2} = \left(\frac{A_1}{A_2}\right)^{\frac{1}{4}} = \frac{1}{2}$$

$$\lambda_m \propto \frac{1}{T} \Longrightarrow \frac{\lambda_1}{\lambda_2} = \frac{2}{1}$$

111.
$$n_1 + n_2 = n_1^1 + n_2^1$$

$$\frac{2P_0V_0}{RT_0} = \frac{PV_0}{R} \left(\frac{1}{T_0} + \frac{1}{2T_0} \right)$$

$$P = \frac{4P_0}{3} \Rightarrow n_2^1 = \frac{PV_0}{2RT_0} = \frac{2P_0V_0}{3RT_0}$$

112.
$$T_1 = 2\pi \sqrt{\frac{I}{MB_e}}$$
 and $T_2 = 2\pi \sqrt{\frac{I}{MB_V}}$

$$\frac{T_1}{T_2} = \sqrt{\sin \delta}$$

113. Diamagnetic $\Rightarrow \chi$ is small an d –ve

114.
$$I = \chi H, H \propto B \text{ and } \chi \propto \frac{1}{T} \Rightarrow I \propto \frac{B}{T}$$

- 115. Conceptual
- 116. Conceptual

117.
$$V_2 > V_1 \Longrightarrow KE_2 > KE_1$$

$$E_{nh} = KE_{max} + \phi \Longrightarrow \lambda_1 > \lambda_2$$

118.
$$KE_{\text{max}} = E - \phi$$

$$0.8 = E - \phi$$

$$1.1-1.2E-\phi$$

$$1.2(0.8+\phi)=1.1+\phi$$

$$0.2\phi = (1.1 - 0.96)eV$$

$$\phi = 0.7eV$$

119.
$$\lambda_{Na} > \lambda_{blue}$$

120.
$$\lambda = 2\pi rn$$

$$= 2 \times 3.14 \times 0.529 n^2 A^0 \approx 3.33 n A^0$$

121.
$$L = \frac{nh}{2\pi} \Rightarrow n = 2$$

$$\therefore K = -(TE) = 3.4eV$$

122.
$$E_n = \frac{-Z^2 e^4 m}{8\varepsilon_o^2 n^2 h^2} \Rightarrow E_n \propto m$$

$$r_n = \frac{n^2 h^2 \varepsilon_0}{Ze^2 \pi m} \Longrightarrow r_n \propto \frac{1}{m}$$

123.
$$r_{n+1} - r_n = r_{n-1}$$

$$(n+1)^2 - n^2 = (n-1)^2 \Rightarrow n = 4$$

124.
$$K = \frac{13.6}{n^2} eV \Rightarrow R = 0.529n^2 A^0$$

KR=constant

$$125. N = n_0 e^{-\lambda t}$$

$$\frac{N_A}{N_B} = \left(\frac{1}{2}\right) \frac{e^{-\lambda_A t}}{e^{-\lambda_B t}} \Longrightarrow \frac{1}{2e} = \frac{1}{2}e^{-\lambda_B t} \Longrightarrow t = \frac{1}{\lambda_B}$$

126.
$$\frac{Q}{KE_{\alpha}} = \left(1 + \frac{m}{M - m}\right) \Rightarrow Q = \left(\frac{M}{M - m}\right) \frac{P^2}{2m}$$

127.
$$P = \frac{nE}{t}$$

128.
$$8-4\times10^{-3}R_{1}-4=0 \Rightarrow R_{1}=10^{3}\Omega$$

129. Conceptual

130.
$$I_2 = \frac{2}{10} = 0.2 mA$$

$$I = \frac{8}{10} = 0.8mA$$

$$I_1 = I - I_2 = 0.6mA$$

131.
$$I_1 = 0, I_2 = \frac{10V}{2K\Omega}$$

132.
$$P = P_1 + P_2$$

$$P = P_1 - P_2 \Longrightarrow \frac{h}{\lambda} = \frac{h}{\lambda_1} - \frac{h}{\lambda_2}$$

133.
$$\lambda_{particle} = \frac{hV}{2F}, \lambda_{ph} = \frac{hc}{F}$$

$$\frac{\lambda_{particle}}{\lambda_{ph}} = \frac{V}{2C} \times \frac{E_{ph}}{E_{particle}} = \frac{1}{2 \times 10} \times \frac{100}{1}$$

- 134. Peak value of input AC voltage will be dropped across the capacitor
- 135. Conceptual

CHEMISTRY

136. For the reaction, $CaCO_3(s) \rightleftharpoons CaO(s) + CO_2(g)$; $K = P_{CO_2}(g)$

We know $\log_{10} K = \log_{10} A - \frac{\Delta H^0}{2.303R} \times \frac{1}{T}$

$$\log_{10} P_{CO_2} = \log_{10} A - \frac{\Delta H^0}{2.303R} \times \frac{1}{T}$$

The reaction is endothermic, therefore, $log_{10} P_{CO_2}$ will linearly decrease with increase in the value of $\left(\frac{1}{\tau}\right)$.

137. Let the solubility of CaF₂ in 0.1MNaF be 'x'M, then

$$[Ca^{+2}] = x \mathcal{M}. [F] = (2x+0.1)\mathcal{M},$$

$$K_{sp} = [Ca^{+2}] [F^{-1}]^2$$
,

$$3.4 \times 10^{-11} = x (2x+0.1)^2 = x (4x^2 + 0.01 + 0.4x)$$

As the value of x is very much less, x^2 and x^3 terms can be neglected.

$$3.4 \times 10^{-11} = 0.01 \text{ x}$$
, then $x = 3.4 \times 10^{-9}$

138.
$$H_2O \rightleftharpoons H^+ + OH^-$$

If
$$\mathcal{T}^{\uparrow}$$
, [H⁺] and [OH⁻] $^{\uparrow}$

pH and pOH ↓

139.
$$K_h = \frac{1}{K_{eq}} = 10^{-9}$$
 $K_h = \frac{K_w}{K_a}$ $K_a = \frac{10^{-14}}{10^{-9}} = 10^{-5}$

$$K_h = \frac{K_w}{K_a}$$

$$K_a = \frac{10^{-14}}{10^{-9}} = 10^{-5}$$

$$[H^+] = \sqrt{\frac{K_w \times K_a}{C}} = \sqrt{\frac{10^{-14} \times 10^{-5}}{.1}}$$

$$[H^+] = 10^9 : pH = 9$$

 \Rightarrow K_P decrease with temperature hence, the reaction is exothermic. \Rightarrow Value of Δn

141.
$$S = \frac{10W}{M} mol \ litre$$
 $K_{sp} of \ Ca_3 \left(PO_4\right)_2 = 108S^5 = 108 \left(\frac{10W}{M}\right)^5 = 10^7 \left(\frac{W}{M}\right)^5$ (approximately)

 $HCCOH + KOH \rightarrow HCOOK + H_2O$ **14**2.

After reaction it forms Buffer solution

$$[HCOOH] = \frac{10}{90}$$

$$[HCOOK] = \frac{10}{90}$$

$$pH = pK_a + log \frac{[Salt]}{[Acid]}$$

$$pH = pK_a$$

$$pH = 4 - \log(2)$$

$$pH = 3.7$$

143. Conceptual

 $K_P = 10$ atm⁻² f rom unit of K_P , we can calculate $\Delta n = -2$ 144.

$$K_{_{P}} = K_{_{C}} \left(R \mathcal{T} \right)^{_{\Delta n}} = K_{_{C}} \left(R \mathcal{T} \right)^{^{_{-2}}} = \frac{K_{_{C}}}{\left(R \mathcal{T} \right)^{^{_{2}}}} \qquad \qquad \therefore K_{_{P}} < K_{_{C}}$$

145. $\Delta G^{\circ} = -2.303 RT \log K_c$

146. Rate=
$$K[H_2O_2]$$
 $2 \times 10^{-4} = \frac{3 \times 10^{-3}}{60} \times [H_2O_2]$ $\therefore [H_2O_2] = 4 \mathcal{M}$

$$\therefore [\mathsf{H}_2\mathsf{O}_2] = 4\mathcal{M}$$

147. $t_{90\%} = 3.3 \times t_{50\%}$

In case of zero order reactions; x = kt, $t_{50\%} = a/2k$, slope = 1/2k = $tan 45^0 = 1$, hence, 148.

149.
$$\frac{\mathcal{E}_{a}^{1}}{\mathcal{T}_{1}} = \frac{\mathcal{E}_{a}}{\mathcal{T}_{2}} = \frac{10}{300} = \frac{20}{\mathcal{T}_{2}}$$
 $\therefore \mathcal{T}_{2} = 600 \text{K} = 327^{\circ} \text{C}.$

Third layer arrangement is repeater of first layer arrangement. 150.

In Schottky defect, equal number of cations and anions are missing from the lattice sites 151.

Conceptual **15**2.

153. $density = ZM / a^3 \times N$

154. No chi ral carbon H,NCH,COOH

155. Conceptual

156. Osteomalacia is due to the deficiency of Vitamin D.Vitamin-B₆(Pynidoxine) deficiency causes Convulsions

157. HNO_3 oxidizes CH_2 – OH to COOH