

# 290

QUESTION PAPER  
SERIES CODE  
**A**

Registration No. :

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Centre of Exam. : \_\_\_\_\_

Name of Candidate : \_\_\_\_\_

Signature of Invigilator

## ENTRANCE EXAMINATION, 2017

Ph.D. IN MOLECULAR MEDICINE

[ Field of Study Code : CMMH (905)/CMMJ (816) ]

Time Allowed : 3 hours

Maximum Marks : 70

### INSTRUCTIONS FOR CANDIDATES

Candidates must read carefully the following instructions before attempting the Question Paper :

- (i) Write your Name and Registration Number in the space provided for the purpose on the top of this Question Paper and in the Answer Sheet.
- (ii) **Please darken the appropriate Circle of Question Paper Series Code on the Answer Sheet.**
- (iii) The Question Paper is divided into two Parts : Part—A and Part—B. Both Parts have multiple-choice questions. All answers are to be entered in the Answer Sheet provided with the Question Paper for the purpose by darkening the correct choice i.e., (a) or (b) or (c) or (d) with BALLPOINT PEN only against each question in the corresponding circle.
- (iv) Part—A consists of 45 questions. **Answer only 30 questions.**  
In case any candidate answers more than the required questions, the first 30 questions attempted will be evaluated.
- (v) Part—B consists of 45 questions. **Answer only 40 questions.**  
In case any candidate answers more than the required questions, the first 40 questions attempted will be evaluated.
- (vi) Each correct answer carries 1 mark. **There will be negative marking and ½ mark will be deducted for each wrong answer.**
- (vii) Answer written by the candidate inside the Question Paper will not be evaluated.
- (viii) Calculators and log tables may be used. Cell phones and other internet devices are strictly prohibited.
- (ix) Pages at the end have been provided for rough work.
- (x) Return the Question Paper and Answer Sheet/OMR to the invigilator at the end of the Entrance Examination. **DO NOT FOLD THE ANSWER SHEET.**

### INSTRUCTIONS FOR MARKING ANSWERS

1. Use only Blue/Black Ballpoint Pen (do not use pencil) to darken the appropriate Circle.
2. Please darken the whole Circle.
3. Darken ONLY ONE CIRCLE for each question as shown in example below :

Wrong ○ (b) ○ (c) ○ (d)	Wrong ⊗ (b) ○ (c) ○ (d)	Wrong ⊗ (b) ○ (c) ⊗ (d)	Wrong ● (b) ○ (c) ○ (d)	Correct ● (a) ● (b) ○ (c) ○ (d)
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4. Once marked, no change in the answer is allowed.
5. Please do not make any stray marks on the Answer Sheet.
6. Please do not do any rough work on the Answer Sheet.
7. Mark your answer only in the appropriate space against the number corresponding to the question.
8. **Ensure that you have darkened the appropriate Circle of Question Paper Series Code on the Answer Sheet.**

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**/290-A**

**PART—A**

( Answer *any* 30 questions )

1. Who invented hybridoma technique for the production of monoclonal antibodies?
  - (a) Kohler and Milstein
  - (b) Niels Jerne
  - (c) Karl Landsteiner
  - (d) Robert Koch
  
2. If an inhibitor inhibits an enzyme reaction by binding to enzyme-substrate complex but not directly binding to enzyme, which type of enzyme inhibition is that?
  - (a) Competitive
  - (b) Noncompetitive
  - (c) Cooperative
  - (d) Noncooperative
  
3. What is the equation for slope in Lineweaver-Burk plot?
  - (a)  $V_0 / V_{\max}$
  - (b)  $V_0 / K_m$
  - (c)  $V_{\max} / K_m$
  - (d)  $K_m / V_{\max}$
  
4. RNA is susceptible to base hydrolysis whereas DNA is not, due to
  - (a) presence of uracil in RNA
  - (b) single-stranded nature
  - (c) the presence of 2' OH group in the ribose sugar
  - (d) the presence of 3' OH group in the ribose sugar

5. In fluorescence, the wavelength of emitted light is
- (a) greater than excitation wavelength
  - (b) less than excitation wavelength
  - (c) equal to excitation wavelength
  - (d) could be either greater than or less than excitation wavelength
6. If cytosine is 18% in DNA, then what will be the percentage of adenine?
- (a) 36%
  - (b) 32%
  - (c) 64%
  - (d) 72%
7. The difference between the length and breadth of a rectangle is 23 m. If its perimeter is 206 m, then its area is
- (a) 1520 m<sup>2</sup>
  - (b) 2420 m<sup>2</sup>
  - (c) 2480 m<sup>2</sup>
  - (d) 2520 m<sup>2</sup>
8. Mr. Thomas invested a total amount of ₹ 13,900 in two different schemes A and B at the simple interest rate of 14% p.a. and 11% p.a. respectively. If the total amount of simple interest earned in 2 years is ₹ 3,508, what was the amount invested in scheme B?
- (a) ₹ 6,400
  - (b) ₹ 6,500
  - (c) ₹ 7,200
  - (d) ₹ 7,500

9. If  $a - b = 3$  and  $a^2 + b^2 = 29$ , find the value of  $ab$ .
- (a) 10  
(b) 12  
(c) 15  
(d) 18
10. A train runs at the speed of 72 kmph and crosses a 250 m long platform in 26 seconds. What is the length of the train?
- (a) 230 m  
(b) 240 m  
(c) 260 m  
(d) 270 m
11. Ram can do a piece of work in 6 days and Shyam in 8 days. Ram and Shyam undertook to do it for ₹ 3,200. With the help of Raheem, they completed the work in 3 days. How much is to be paid to Raheem?
- (a) ₹ 375  
(b) ₹ 400  
(c) ₹ 600  
(d) ₹ 800
12. The 2015 Nobel Prize in Physiology and Medicine was awarded for discovery of which antimalarial drug?
- (a) Chloroquine  
(b) Artemisinin  
(c) Quinine  
(d) Mefloquine

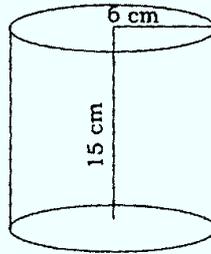
13. The best evidence that the interaction between a protein and a nucleic acid in a particular complex is hydrophobic, if the complex is dissociated by
- (a) high salt
  - (b) organic solvents
  - (c) treatment with a nuclease
  - (d) treatment with a protease
14. An experiment was designed to obtain nonspecific transcription from both strands of a DNA molecule. Which of the following strategies would be most effective in achieving this?
- (a) Include the RNA holoenzyme in the reaction
  - (b) Use the core enzyme of RNA polymerase
  - (c) Enrich the preparation with sigma subunit
  - (d) Use intact DNA
15. A scientist has isolated and purified *Leishmania donovani* protein of 150 amino acids from bacterial culture. He is confused whether he grew wild-type bacteria or a mutant strain that produces the protein with a valine residue at position 66 instead of the glycine found in the wild-type strain. For quick characterization of protein he will use
- (a) ion-exchange chromatography
  - (b) SDS-PAGE
  - (c) mass spectroscopy
  - (d) HPLC
16. If you want to separate a mixture containing two proteins having similar molecular mass but different oligomeric properties, you should do
- (a) isoelectric focusing
  - (b) SDS-PAGE analysis
  - (c) native PAGE analysis
  - (d) Both (b) and (c)

17. Hippocampus is involved in
- (a) aggression and fear
  - (b) regulating pituitary gland hormones
  - (c) memory processing
  - (d) None of the above
18. Which of the following most accurately explains the cause for the abnormal numbers of chromosomes during human reproduction that can result in Down syndrome, Turner's syndrome or Klinefelter's syndrome?
- (a) The occurrence of nondisjunction of homologous chromosomes during meiosis
  - (b) The duplicative production of extra chromosomes during DNA replication
  - (c) The abnormal pairing of nonhomologous chromosomes during prophase of meiosis I
  - (d) The selective loss of particular chromosomes from the sex cells after formation of the mature gamete
19. Which of the following best predicts the direction of a chemical reaction?
- (a)  $S$  (entropy change)
  - (b)  $H$  (enthalpy change)
  - (c)  $E$  (internal energy change)
  - (d)  $G$  (Gibbs free energy change)
20. Thyroxine labelled with  $I^{131}$  is administered to a patient for the purpose of imaging the thyroid gland. The radioactive half-life of the isotope is 8 days. The biological half-life (the time required for half of the compound to be eliminated from the body) is 2 days. The time at which  $\frac{3}{4}$  of the original radioactivity will no longer be detectable in the body is closest to
- (a) 2.0 days
  - (b) 3.2 days
  - (c) 4.0 days
  - (d) 4.8 days

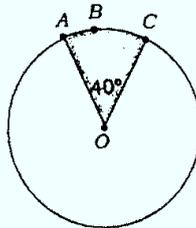
- 21.** The more negative standard reduction potential of a compound, the greater the tendency
- (a) to lose electrons
  - (b) to gain electrons
  - (c) to lose and gain electrons
  - (d) None of the above
- 22.** Which of the following amino acids contributes to nitrogen atom of purine and pyrimidine?
- (a) Tyrosine
  - (b) Histidine
  - (c) Glutamate
  - (d) Phenylalanine
- 23.** In alpha-helix structure of proteins, the hydrogen bond is formed
- (a) between neighboring amino acids
  - (b) between every four amino acids
  - (c) between neighboring helices
  - (d) Hydrogen bonds are not involved in alpha-helix
- 24.** The specific modification in the inactivated mammalian X chromosome in females is
- (a) heavy methylation
  - (b) polyadenylation
  - (c) phosphorylation
  - (d) None of the above
- 25.** The brown colour of some algae is due to the presence of the pigment
- (a) chlorophyll
  - (b) phycocyanin
  - (c) carotene
  - (d) fucoxanthin

26. Which one of the following statements is correct?
- (a) Phytochromes perceive red/far red light and cryptochromes perceive blue light
  - (b) Phytochromes perceive blue light and cryptochromes perceive red/far red light
  - (c) Both phytochromes and cryptochromes can perceive the entire visible spectrum
  - (d) Phytochromes and cryptochromes absorb white light and infrared light respectively
27. Plants bend towards a light source as a result of
- (a) increased amount of food synthesized by their leaves
  - (b) an unequal auxin distribution in their stem
  - (c) increased auxin concentration in the stem
  - (d) inability to synthesize chemical regulators
28. *E. coli* cells with an O.D. 600 nm of 0.6 is optimal for making competent cells. The current O.D. of a culture is 0.05. How long should you wait for the O.D. to reach 0.6? Consider the duplication time for *E. coli* is 20 minutes.
- (a) 2 hours 20 minutes
  - (b) 1 hour
  - (c) 1 hour 10 minutes
  - (d) 1 hour 30 minutes
29. In an experiment, a mammalian cell line that has a doubling time of 24 hours, is synchronized in G1 and then labelled for 2 days with BrdU. The chromosomal DNA is isolated and the density analyzed by centrifugation in cesium chloride gradients. Which of the following patterns would be seen? (H=heavy; L=light)
- (a) 100% H/H
  - (b) 100% H/L
  - (c) 50% H/H; 50% H/L
  - (d) 50% H/H; 50% L/L
30. Which of the following systems has the greatest entropy?
- (a) Water vapour
  - (b) Liquid water at pH 7.0, 37 °C
  - (c) Water with sufficient acid added to lower the pH to 2.0
  - (d) Ice

31. In the cross  $AaBb \times AaBb$ , Mendel's principle of independent assortment predicts that the ratio of the four possible phenotypes of the offspring will be
- 1:1:1:1
  - 3:2:2:1
  - 4:2:2:1
  - 9:3:3:1
32. A cylinder of 15 cm height has a radius of 6 cm. What is the area of the cylinder?



- $791.7 \text{ cm}^2$
  - $394.9 \text{ cm}^2$
  - $395.8 \text{ cm}^2$
  - $1583.4 \text{ cm}^2$
33. An AT rich DNA fragment with melting temperature ( $T_m$ ) of  $60^\circ \text{C}$  will contain approximately
- 16 GC pairs and 6 AT pairs
  - 6 GC pairs and 21 AT pairs
  - 8 GC pairs and 19 AT pairs
  - 15 GC pairs and 15 AT pairs
34. In the figure below, the circle with centre  $O$  has a radius of 4. The area of the shaded region is



- $\frac{8\pi}{9}$
- $\frac{4\pi}{9}$
- $\frac{16\pi}{9}$
- $\frac{2\pi}{9}$

35. A gas occupies 3.56 L at an atmospheric pressure of 1.00. If the atmospheric pressure increases to 3.00, what will be the volume of this gas at constant temperature?
- (a) 0.29
  - (b) 0.59
  - (c) 1.19
  - (d) 2.37
36. The original human genome was sequenced using
- (a) shotgun cloning
  - (b) whole genome sequencing
  - (c) Sanger protein sequencing
  - (d) All of the above
37. BrahMos is a supersonic cruise missile, made in India. This missile can travel at speed
- (a) more than speed of sound
  - (b) more than speed of light
  - (c) less than speed of sound
  - (d) None of the above
38. In a colour printer, the term CMYK option stands for
- (a) cyan, magenta, yellow and black
  - (b) centered, maximal, yellow, keurig controls
  - (c) crédit, mutuel, yonder, kampuchea
  - (d) cyan, mauve, yellow, khaki
39. The human retina plays a significant role in vision. This organ is unique since
- (a) it is considered part of the central nervous system
  - (b) it is composed of corneal epithelial cells
  - (c) it is connected with the vagus nerve
  - (d) it supplies the eye with macrophages during infection
40. The tryptophan pathway results in the production of
- (a) serotonin
  - (b) vitamin B<sub>3</sub>
  - (c) auxins
  - (d) All of the above

41. The N95 mask is frequently seen in use by Indian people in metros. The designation indicates that the respirator will
- (a) capture 95 micron or bigger particles
  - (b) 95% of particulates as advertised
  - (c) trap passage of nitrogen and purify oxygen
  - (d) None of the above
42. Serum glutamic oxaloacetic transaminase is an enzyme expressed in
- (a) blood
  - (b) liver and heart
  - (c) kidneys
  - (d) liver and kidneys
43. Which of the following is **not** true regarding the blood-brain barrier?
- (a) It is constituted by tight junctions between the endothelial cells of brain capillaries and glial tissue
  - (b) It allows the passage of lipid-soluble drugs into the brain
  - (c) It limits the entry of highly polar and ionized drugs into the brain
  - (d) It does not regulate the passage of substances from brain into the blood
44. Increased serum level of which one of the following is associated with the decreased risk of atherosclerosis?
- (a) VLDL
  - (b) LDL
  - (c) HDL
  - (d) Total cholesterol
45. In data analysis, the most widely used measure of dispersion is
- (a) median
  - (b) mean
  - (c) variance and standard deviation
  - (d) None of the above

**PART—B**

( Answer any 40 questions )

46. The electromagnetic wave used for satellite communications is
- (a) radio wave
  - (b) ground wave
  - (c) microwave
  - (d) Both (a) and (c)
47. Name the class of immunoglobulins which have 4 CH Ig domains in them.
- (a) IgG and IgA
  - (b) IgM and IgE
  - (c) IgG, IgD and IgA
  - (d) All of the above
48. Name the cyclin molecule that is present throughout the cell cycle.
- (a) Cyclin A
  - (b) Cyclin B
  - (c) Cyclin D
  - (d) Cyclin E
49. Which property of the protein will help you to detect the presence of alpha helices in the protein in aqueous solution?
- (a) Intrinsic fluorescence
  - (b) Isoelectric point
  - (c) Circular dichroism
  - (d) None of the above

50. The Kyte-Doolittle plots of proteins indicate
- (a) mass
  - (b) net charge
  - (c) hydrophobicity
  - (d) intrinsic disorder
51. Which of the following metabolic processes occurs in the mitochondria?
- (a) Cholesterol synthesis
  - (b) Fatty acid synthesis
  - (c) Glycolysis
  - (d) Fatty acid beta-oxidation
52. In glycoproteins, the carbohydrate moiety always gets attached through which of the following amino acids?
- (a) Glycine or alanine
  - (b) Glutamine or arginine
  - (c) Aspartate or glutamate
  - (d) Asparagine, serine or threonine
53. For the following reaction, which is the reducing agent?
- $$\text{Isocitrate} + \text{NAD}^+ = \alpha\text{-ketoglutarate} + \text{CO}_2 + \text{NADH}$$
- (a) Isocitrate
  - (b)  $\text{NAD}^+$
  - (c)  $\alpha$ -ketoglutarate
  - (d)  $\text{CO}_2$
54. Infected mosquitoes transmit which parasitic worm to people to cause tropical elephantitis?
- (a) *Loa loa*
  - (b) *Wuchereria bancrofti*
  - (c) *Onchocerca volvulus*
  - (d) *Trichina spiralis*

55. Which of the following is/are examples of alpha-beta exotoxins?
- (a) Cholera toxin
  - (b) Anthrax toxin
  - (c) Botulinum toxin
  - (d) All of the above
56. Specific recognition between cell types such as leukocytes and endothelial cells of blood vessels is mediated by cell surface glycoproteins called
- (a) selectins
  - (b) fibronectins
  - (c) spectrins
  - (d) collagen
57. Thymine differs from uracil in having
- (a) a methyl group at position C5
  - (b) an amino group at position C3
  - (c) a keto group at position C4
  - (d) a keto group at position C2
58. GABA (Gamma Amino-butyric Acid) is known as
- (a) excitatory neurotransmitter
  - (b) inhibitory neurotransmitter
  - (c) action potential
  - (d) None of the above
59. Circulating hormones are known to be
- (a) paracrine in nature
  - (b) autocrine in nature
  - (c) endocrine in nature
  - (d) exocrine in nature

60. miRNAs (microRNAs) have been shown to regulate gene expression by two ways :  
 (1) they perform gene silencing by binding to mRNA and inhibiting translation and  
 (2) they bind to mRNA targets and induce their degradation. The following characteristics can be applicable to the miRNAs that inhibit mRNA translation :
- P. miRNA is partially complementary to a region of target mRNA in the 3' UTR  
 R. miRNA always base pairs with mRNA through 6-7 nucleotides at the 5' end referred to as 'seed sequence' as well as few additional bases elsewhere  
 S. miRNA is always partially complementary to the 5' UTR of target mRNA  
 Q. miRNA always base pairs with mRNA around an AU-rich sequence
- (a) P and Q  
 (b) P and R  
 (c) R and S  
 (d) P and S
61. Which of the following cell compartments is associated with a protein skeleton composed of lamins?
- (a) Chloroplast  
 (b) Basement membrane  
 (c) Mitochondrion  
 (d) Nucleus
62. A second mutation in the same gene restores the wild-type phenotype. This phenomenon is referred to as
- (a) intergenic complementation  
 (b) gene conversion  
 (c) synthetic enhancement  
 (d) intragenic suppression
63. Which of the following statements is true regarding the polysaccharides starch, glycogen, cellulose and chitin?
- (a) All have  $\alpha$  1-4 linkages  
 (b) Starch is built from a different monomer than the others  
 (c) Each is built from a single type of monomer  
 (d) Only chitin has a core protein

64. Which of the following events occurs first as a result of EGF binding to its receptor?
- (a) Activation of a serine/threonine kinase
  - (b) Activation of a tyrosine phosphatase
  - (c) Activation of a tyrosine kinase
  - (d) Activation of a phospholipase
65. Which of the following is **not** the function of cholesterol?
- (a) Bile acid synthesis
  - (b) Steroid hormone synthesis
  - (c) Thyroid hormone synthesis
  - (d) Membrane fluidity
66. Endothelial cells in tumors
- (a) play no role in tumor progression
  - (b) have abnormalities in gene expression and require growth factors for survival
  - (c) have defective barrier function to plasma proteins
  - (d) Both (b) and (c)
67. Oxysomes are ATP synthases which are present on
- (a) outer mitochondrial membrane facing cytoplasm
  - (b) outer nuclear membrane facing cytoplasm
  - (c) inner mitochondrial membrane facing matrix
  - (d) inner mitochondrial membrane facing cytoplasm
68. Digesting a plasmid DNA with the restriction enzymes BamHI and BglII generate 3.2 kb and 2.4 kb fragments. Digesting with NdeI and BamHI generate 2.4 kb, 1.2 kb and 3 kb fragments. Digestion with NdeI and BglII generate 5.6 kb fragment. Which of the following is true for the plasmid DNA?
- (a) Two NdeI sites
  - (b) Two BglII sites
  - (c) Two BamHI sites
  - (d) One BglII site

69. In HeLa cells, protein A interacts with protein B and C. Protein D interacts with protein A and C. Protein E interacts with protein C only. You have immuno-purified protein D using specific antibodies and resolved by SDS-PAGE. The number of bands that you will see in a gel is/are
- (a) 1
  - (b) 5
  - (c) 7
  - (d) 3
70. A solution contains DNA polymerase II,  $Mg^{2+}$  salts of dATP, dGTP, dCTP and dTTP, and an appropriate buffer. Which of the following DNA molecules would serve as a template for DNA synthesis when added to this solution?
- (a) A single-stranded closed circle
  - (b) A single-stranded closed circle base-paired to a shorter linear strand with a 3'-terminal hydroxyl
  - (c) A single-stranded closed circle base-paired to a shorter linear strand with a 3'-terminal phosphate
  - (d) A blunt-ended, double-stranded linear molecule with a 3'-terminal hydroxyl at each end
71. Mutations that cause cells of one lineage to develop the phenotype of a different cell lineage are called
- (a) silent mutations
  - (b) homeotic mutations
  - (c) homozygous mutations
  - (d) heterozygous mutations
72. During embryonic development, which germ layer gives rise to the nervous system?
- (a) Ectoderm
  - (b) Mesoderm
  - (c) Endoderm
  - (d) Blastoderm

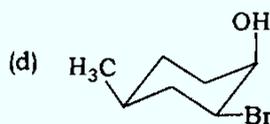
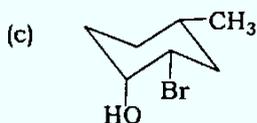
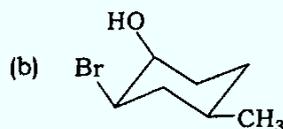
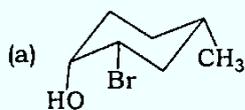
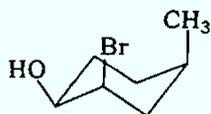
- 73.** The fundamental difference between proteasome and lysosome mediated degradation is
- (a) target is ubiquitinated in proteasome pathway
  - (b) target is oxidized in lysosome pathway
  - (c) target is glycosylated in lysosome pathway
  - (d) None of the above
- 74.** The MHC class I molecules are
- (a) present only in the brain major histocompatibility complex
  - (b) one of two primary classes of major histocompatibility complex
  - (c) expressed on dendritic cells
  - (d) similar to interleukin receptor
- 75.** Biofilms are
- (a) hydrophobic films produced by bacteria
  - (b) surface colonized sessile bacteria
  - (c) bacteria commonly present on inert surfaces
  - (d) None of the above
- 76.** Which of the following is a type B (unpredictable) adverse drug reaction?
- (a) Side effect
  - (b) Toxic effect
  - (c) Idiosyncrasy
  - (d) Physical dependence
- 77.** The beta lactam antibiotics include which of the following?
- (a) Cephalosporins
  - (b) Monobactams
  - (c) Carbapenems
  - (d) All of the above

- 78.** Clavulanic acid is combined with amoxicillin because
- (a) it kills bacteria that are not killed by amoxicillin
  - (b) it retards renal excretion of amoxicillin
  - (c) it counteracts the adverse effects of amoxicillin
  - (d) it inhibits beta lactamases that destroy amoxicillin
- 79.** Rifampicin kills tubercle bacilli by
- (a) binding to mycobacterial DNA dependent RNA polymerase
  - (b) inhibiting mycobacterial DNA synthesis
  - (c) inhibiting synthesis of mycolic acids in mycobacteria
  - (d) damaging mycobacterial mitochondria
- 80.** In drug design, QSAR refers to
- (a) quantitative structure-activity relationship
  - (b) quantitative structure-advanced relationship
  - (c) quantitative structure-autonomous relationship
  - (d) quantitative structure-aided relationship
- 81.** Parenteral administration
- (a) cannot be used with unconsciousness patients
  - (b) generally results in a less accurate dosage than oral administration
  - (c) usually produces a more rapid response than oral administration
  - (d) is too slow for emergency use

82. Pharmacodynamics involves the study of following **Except**

- (a) biological and therapeutic effects of drugs
- (b) absorption and distribution of drugs
- (c) mechanisms of drug action
- (d) drug interactions

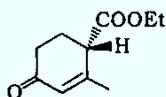
83. Ring flipping of the compound in the following conformation leads to



84. Among the following molecules, the one that will **not** undergo a Diels-Alder reaction is

- (a) ethylene
- (b) 2-butene
- (c) maleic anhydride
- (d) succinic anhydride

85. The IUPAC name of the compound given below is



- (a) ethyl (R)-2-methyl-4-oxocyclohex-2-enecarboxylate
- (b) ethyl (S)-2-methyl-4-oxocyclohex-2-enecarboxylate
- (c) (R)-4-ethoxycarbonyl-3-methylcyclohex-2-onone
- (d) (S)-4-ethoxycarbonyl-3-methylcyclohex-2-onone

86. Rearrange the following in the increasing order of acidity :

- (i) Benzoic acid
- (ii) *p*-methoxybenzoic acid
- (iii) *o*-methoxybenzoic acid

- (a) (i) < (ii) < (iii)
- (b) (iii) < (i) < (ii)
- (c) (ii) < (i) < (iii)
- (d) (iii) < (ii) < (i)

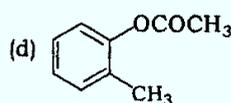
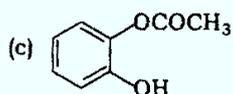
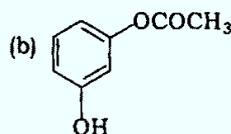
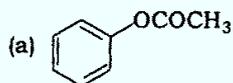
87. The correct order of the stability of the following carbon radicals is

- (a)  $\text{Ph}_3\text{C}\cdot > (\text{CH}_3)_3\text{C}\cdot > (\text{CH}_3)_2\text{CH}\cdot > \text{CH}_3\text{CH}_2\cdot$
- (b)  $\text{CH}_3\text{CH}_2\cdot > \text{Ph}_3\text{C}\cdot > (\text{CH}_3)_3\text{C}\cdot > (\text{CH}_3)_2\text{CH}\cdot$
- (c)  $(\text{CH}_3)_3\text{C}\cdot > (\text{CH}_3)_2\text{CH}\cdot > \text{CH}_3\text{CH}_2\cdot > \text{Ph}_3\text{C}\cdot$
- (d)  $(\text{CH}_3)_2\text{CH}\cdot > \text{CH}_3\text{CH}_2\cdot > \text{Ph}_3\text{C}\cdot > (\text{CH}_3)_3\text{C}\cdot$

88. The nucleophile of aldol condensation in acidic medium is

- (a) enolate
- (b) enol
- (c) Both of the above
- (d) None of the above

89. Among the following esters, the one that undergoes acid hydrolysis fastest is



90. Blood cholesterol lowering agent is produced by which of the following fungi

- (a) *Monascus purpureus*
- (b) *Trichoderma polysporum*
- (c) *Penicillium notatum*
- (d) *Aspergillus niger*

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E7—125×2