



ST. ANTHONY'S COLLEGE SHILLONG

ENTRANCE TEST FOR ADMISSION INTO UNDER GRADUATE PROFESSIONAL COURSES 2011

BIOTECHNOLOGY

DATE : THURSDAY, 5TH MAY, 2011
TIME : 9:30 AM – 10:30 AM
DURATION: 1 HOUR

INSTRUCTIONS

- This test has two parts. Part A and Part B.
- **Part A** has a total of **40** multiple choice questions. Part A is to be answered on the **Answer Sheet** provided to you by darkening the correct answer as shown. Each question carries 1 mark and Negative marking of 0.25 for a wrong answer.



- **Part B** has a total of **20** questions. These questions are to be answered on the question paper itself, in the space provided.
- For each question you may select only **ONE** answer. Selecting more than one option qualifies as a wrong answer. You can use a pen/pencil for answering the questions.
- Each correct answer in Part A and B carries a weightage of 1 mark while a wrong answer carries a penalty of – 0.25.
- Write your **Test Roll Number** given on your Admit Card in the Answer Sheet and question paper in the space provided.
- **Please preserve your Admit Card.** It will be required at the time of admission.
- The Roll Numbers of those shortlisted for admission on the basis of this Entrance Test will be published on the College Notice Boards as well as on the College Web Site by evening today, the 5th May, 2011.
- The final admission will be done on a first come, first served basis, after the marksheets of the Class XII examinations of the Meghalaya Board of School Education are available, provided the eligibility criteria as laid down in the prospectus are fulfilled. Shortlisted students from other boards and streams whose Class XII results are declared later will also be considered for admission provided they report not later than 2 days after the result declaration of their respective board examinations along with their marksheets (Original or Downloaded).

TEST ROLL NO. _____

Invigilators Signature: _____

Part A

(1 mark will be awarded for every correct answer, 0.25 will deducted for every wrong answer)

Choose the best answer in each of the following:

- Plasmids found in bacterial cells are actually molecules of:
(a) DNA (b) RNA
(c) Proteins (d) DNA bound by histones
- Which of the following compounds is resistant to nucleophilic attack by hydroxyl ions?
(a) Acetamide (b) Acetonitrile
(c) Dimethyl ether (d) Methyl acetate
- Considering entropy (S) as a thermodynamic parameter, the criterion for spontaneity of any process is:
(a) $\Delta S_{\text{system}} + \Delta S_{\text{surroundings}} > 0$ (b) $\Delta S_{\text{system}} - \Delta S_{\text{surroundings}} > 0$
(c) $\Delta S_{\text{surroundings}} > 0$ only (d) $\Delta S_{\text{system}} > 0$ only
- One mole of an ideal gas at 300K is expanded isothermally from an initial volume of 1 litre to 10 litres. The ΔE for this process is [given, $R = 2 \text{ cal mol}^{-1} \text{ K}^{-1}$]
(a) 163.7 cal (b) 138.1 cal (c) zero (d) 8 lit atm
- The pK_a of a weak acid is 4.8. What should be the ratio of [acid]/[salt] of a buffer if $\text{pH} = 5.8$ is required?
(a) 0.1 (b) 1 (c) 2 (d) 10
- For a process to occur under adiabatic conditions, the correct condition is:
(a) $\Delta T = 0$ (b) $\Delta p = 0$ (c) $w = 0$ (d) $q = 0$
- Hydrogen bond is not present in:
(a) glycerine (b) water
(c) hydrogen sulphide (d) hydrogen fluoride
- Permanent hardness of water is due to the presence of:
(a) calcium carbonate (b) calcium sulphate
(c) magnesium bicarbonate (d) calcium hydroxide
- The regions of chromatin which usually undergo transcription are:
(a) Nucleosomes (b) Heterochromatin
(c) Euchromatin (d) Both euchromatin and heterochromatin
- The photosynthetic pigments of the chloroplasts are localized in the:
(a) inner membrane (b) inter membrane space
(c) stroma (d) thylakoid membrane
- A 9 + 0 arrangement of microtubules are seen in:
(a) cilia only (b) flagella only
(c) both cilia and flagella (d) centriole
- An eukaryotic ribosome dissociates into the following subunits:
(a) 35s and 45s (b) 30s and 50s
(c) 40s and 50s (d) 40s and 60s
- Which of the following diseases are caused by mosquito bite?
(a) sleeping sickness / malaria / dengue / flue
(b) malaria / dengue / yellow fever / filariasis
(c) malaria / yellow fever / pneumonia / T.B.
(d) malaria / dengue / yellow fever / sleeping sickness
- Which of the following is an egg laying mammal?
(a) Platypus (b) Otter (c) Seal (d) Walrus
- Smooth muscle fibres are NOT:
(a) Spindle shaped (b) Structurally simplest
(c) Under the control of A.N.S (d) Syncytial

16. Cuttlefish belongs to the group:
 (a) Annelida (b) Arthropoda (c) Mollusca (d) Protozoa
17. Meningitis is a disease of the:
 (a) respiratory system (b) digestive system
 (c) nervous system (d) excretory system
18. Which of the following would not make minerals more available to plants?
 (a) Tilling a packed-down or waterlogged soil
 (b) Introducing fungi that can form mycorrhizae into a soil that lack them
 (c) Increasing the rainfall in a wet, forested area
 (d) Raising the pH of a very acid soil
19. In angiosperms meiotic division takes place in:
 (a) Apical meristem (b) Intercalary meristem
 (c) Spore mother cells (d) Pollen grains and ovule
20. Leaf pigment are separated from a mixture by:
 (a) Spectrophotometry (b) Autoradiography
 (c) Chromatography (d) Microcinematography
21. Fruit of poppy (*Papaver somniferum*) is:
 (a) Loculicidal capsule (b) Berry
 (c) Porous capsule (d) None of these
22. The reserve carbohydrates in onion are stored in the fleshy leaves. The characteristic smell of onion bulb is due to presence of :
 (a) Sulphur compound (b) Bad odour of the soil in which they are cultivated
 (c) Sugars (d) Reserve carbohydrates
23. If the distance between two masses is increased by a factor of 2, the gravitational force of attraction between them will
 (a) Reduce by a factor of 4 (b) Increase by a factor of 2
 (c) Reduce by a factor of 2 (d) Remain the same
24. After one α and one β emissions:
 (a) Mass number reduces by 2 (b) Mass number reduces by 4
 (c) Mass number reduces by 4 (d) Mass number remains unchanged
25. The time needed for a net force of 10 Newtons to change the velocity of 5 kilograms mass by 3 meters/second is:
 (a) 1.5 seconds (b) 6 seconds (c) 16.7 seconds (d) 150 seconds
26. The SI unit of pressure is:
 (a) Torr (b) Dyne per centimeter squared
 (c) Atmosphere (d) Pascal
27. Which of the following is used in the fire-extinguisher:
 (a) chloroform (b) carbon tetrachloride
 (c) methylene chloride (d) calcium oxychloride
28. One mole of CO_2 contains:
 (a) 6.02×10^{23} atoms of C (b) 6.02×10^{23} atoms of CO_2
 (c) 18.1×10^{23} atoms of CO (d) 3 g of CO_2
29. Electronegativity values of elements help in predicting:
 (a) strength of the element (b) polarity of the molecules
 (c) size of the molecules (d) valency of the elements
30. Which of the following can exist as dimer?
 (a) Hg^{2+} (b) Cu^{2+} (c) Hg^+ (d) Fe^{2+}
31. Iron is rendered passive by treatment with concentrated :
 (a) H_2SO_4 (b) HCl (c) HNO_3 (d) H_3PO_4
32. If a plant is heterozygous and is designated Bb. The probability of the 'b' gamete fertilizing either 'B' or 'b' is:
 (a) $\frac{1}{2}$ (b) 1 (c) $\frac{1}{4}$ (d) $\frac{1}{8}$

33. The term backcross refers to:
(a) A cross between F_1 hybrid and either of parents
(b) A cross between one F_1 and another F_1 hybrid
(c) A cross between F_1 hybrid and F_1 individual
(d) None of these
34. A gamete contains which of the following?
(a) Both alleles of a gene
(b) only one allele of a gene
(c) All alleles of a gene
(d) No allele of a gene
35. Polymorphism is mainly due to:
(a) Monogenic inheritance
(b) Polygenic inheritance
(c) Both of the above
(d) None of these
36. A plant heterozygous for tallness is selfed; the F_2 generation has both tall and dwarf plants. This proves the principle of:
(a) Dominance
(b) Purity of gametes
(c) Independent assortment
(d) Incomplete dominance
37. 18.5% of 1900 is:
(a) 351
(b) 431.5
(c) 351.5
(d) 421.2
38. The average of 7.015, 0.085, 1.25 and 0.75 is:
(a) 2.275
(b) 2.1
(c) 9.1
(d) 3.1
39. $\frac{4}{5}$ of 2100 is:
(a) 1540
(b) 1680
(c) 16800
(d) 1720
40. In the equation $-11x + 2(3-x) = 32$, the value of x is:
(a) 2
(b) -4
(c) 1
(d) -2

Part B

(1 mark will be awarded for every correct answer, 0.25 will be deducted for every wrong answer)

Fill in the blanks:

1. _____ are plastids that store fats.
2. _____ are also known as microbodies.
3. Evaporation of water involves a/an _____ in the disorder of the system.
4. A minus sign of the free energy change denotes that the reaction tends to proceed _____.
5. The pH of a solution whose hydrogen ion concentration is 10^{-6} is _____.
6. Two or more different compounds having the same molecular formula are known as _____.
7. _____ is the phenomenon exhibited by a compound when it exists in different forms, without any single structure representing the molecule at any instance.
8. Water always contains hydrogen and oxygen in the ratio 1:8 by weight. This is in accordance with the law of _____ proportions.
9. When a current-carrying wire is made to form a coil around a piece of iron, the result is an _____.
10. To correct myopia a _____ lens is used.
11. As a pendulum is raised to higher altitudes, its period _____.
12. The first law of thermodynamics represents conservation of _____.
13. If a pollen of a flower fall on the stigma of another flower belonging to same plant, it is _____.
14. Nitrogen is usually absorbed by the plant in the form of _____.
15. The Father of Zoology is _____.
16. The largest organ of the body is _____.
17. The respiratory organs of spiders are _____.
18. Sprain is caused by the excessive pulling of _____.
19. A _____ cross illustrates the principle of independent assortment.
20. In case of incomplete dominance, phenotype and genotype ratio is _____.
