chemistry -q.①

TAC 2-11   **MT-1 –CHEMISTRY**   30.12.09 Max: 40 Marks
Answer ALL Questions ---- Question paper contains FIVE Pages

Name: …………………………….. I.D.No………………………………… Sec-…………

1. Write the test used to detect the presence of carbohydrates in the laboratory.

[1M]

2. What happens when aqueous solution of glucose is treated with Fehling's solution ? Give the relevant chemical equation. [2M]

3. Write the confirmatory test for identifying oxalic acid in the test laboratory with appropriate chemical equation. [2M]

4. What is Tollen's reagent? Give its use. [2M]

5. For a chemical reaction A → B, it is found that the rate of the reaction quadruples when the concentration of A is doubled. The rate expression for the reaction is rate= k [A] ^{n}. What is the value of n? [2M]

6. Write the reason for the addition of reaction mixture into ice cold water immediately after pipeting out and before the titration is commenced. [2M]

7. Ethyl acetate undergoes hydrolysis in presence of dil.HCl to give ethyl alcohol & acetic acid. What would be order of this reaction? [2M]

8. How is the dissociation constant of an electrolyte related according to Oswald's dilution law? [2M]

9. In case of electrolyte like formic acid, molar conductance at infinite dilution can not be extrapolated from the graph.. Explain. [2M]

10. Define specific conductivity and give its units. [2M]

11. Plot the pH curve for the titration of a strong base added to a strong acid, showing the approximate pH values and mark the stoichiometric point. [2M]

12. Write Henderson-Hasselbalch equation. [2M]

13. Mention any two methods to find the pH of a solution. accurately. [2M]

14. Why dilute H_2SO_4 is added to the Ferrous sulphate solution in the titration?   [2M]

15. Calculate the molarity of the solution containing 3.5005 g of $FeSO_4.7H_2O$ in 250 ml. [2M]

16. Balance the following redox equation using the "half reaction" method in acidic medium.
                                                                                                    [3M]

$Cr_2O_7{}^{2-}$ (aq) + HNO_2 (aq) $\rightarrow$ Cr^{3+} (aq) + $NO_3{}^-$ (aq) (acidic)

17. Name the acylating mixture used in the preparation of acetanilide [3M]

18. Why prolonged heating of aniline during acylation is not advisable [2M]

19. What is the purpose of doing recrystallization [2M]

Rough Work:

RECHECK REQUEST:

****

Given: $c = 2.998 \times 10^8$ m/s; $\mu_o = 4\pi \times 10^{-7}$ M/Amp^2 ; $\varepsilon_o = 8.85 \times 10^{-12}$ F/m;
$h = 6.63 \times 10^{-34}$ J.s; $e = 1.602 \times 10^{-19}$ C; $m_e = 9.1 \times 10^{-31}$ Kg; $m_p = 1.67 \times 10^{-27}$ Kg

----

e/m ratio of the electron

1. Two identical coils carry equal currents and have a common center, but their planes are at right angles to each other. What is the magnitude of the resultant magnetic field at the center if the field due to one coil alone is B?

Single and double slit

2. In a Young's double slit experiment , the slits are separated by 0.28mm and the screen is placed 1.4m away. The distance between the fourth bright fringe and the central fringe is measured to be 1.2cm. What is the wavelength of light used in the experiment?

3. In Young's double slit experiment using a light of wavelength 5898A^o, 92 fringes are seen within a space on the screen. How many fringes are seen with light of wavelength 5461A^o within the same space on the screen?

Plancks Constant

4. The maximum kinetic energy of photoelectrons emitted from a surface when photons of energy 6eV fall on it is 4eV. What will be the stopping potential?

5. The work function of a substance is 4eV. What is the longest wavelength of light can cause the photoelectron emission from this substance?

Induction of solenoid

6. A coil of wire containing 500 circular loops with radius of 4.00 cm is placed between the poles of a large elaectromagnet, where the magnetic field is uniform, perpendicular to the plane of the coil , and increasing at the rate of 0.2 T^{-1}. What is the magnitude of the resulting induced e.m.f.?

Solar Cell

7. The width of forbidden gap in silicon crystal is 1.1 eV. When the crystal is converted into p-type semiconductor. The distance of Fermi level from the conduction band is----------------

Hall Effect

8.   When an electron enters at an angle of 30^0 with magnetic field what is the resultant path along which it moves?

Elastic Collision

9. A body P of mass 1 kg moving with a velocity of 3 ms^{-1} along the positive X-direction collides head-on with a body Q of mass 2 kg at rest. If the collision is elastic, then find the velocity of the P after collision.

10. A man of mass m_1 is standing on platform of mass m_2 kept on a smooth horizontal surface. The man starts moving on the platform with a velocity V_r relative to the platform. Find the recoil velocity of the platform.

Electron Diffraction

11. What is De broglie's hypothesis?

12. Calculate the De Broglie wavelength of a dust particle of mass 1.0 x 10^{-9} kg drifting with a speed of 2.0 cm/sec.

2

Fine Structure:

13. The sodium doublet arises from _____ transition in the Sodium atom.

14. A diffraction grating has 10^4 rulings uniformly spaced over 25.0 mm. It is illuminated at normal incidence by yellow light from a Sodium vapor lamp. This light contains two closely spaced lines of wavelengths 589nm and 589.5 nm. At what angle will the first order maximum occur for the first of these wavelengths. The grating spacing is 2500 nm.

Vibrations On Strings

15. In case of standing wave , constructive interference is formed at
    a) node
    b) antinode
    c) either node or antinode
    d) none of the above

16. A string of length 2m fixed between two supports vibrates in two loops. The distance between node and anti-node is
    a) 50cm
    b) 10cm
    c) 100cm
    d) 200cm

RLC Circuits

17. A series LCR circuit connected to a variable frequency 200V source. L=5H, C=80 µF and R=40 Ω. What is the source frequency which drives the circuit at resonance?

18. In the above question, what is the impedance of the circuit at resonance?

Ferromagnetism

19. The material of a permanent magnet has
    a) high retentivity ,low coercivity
    b) low retentivity , low coercivity
    c) low retentivity , low coercivity
    d) high retentivity, high coercivity

20. The number of magnetic line of force cutting through the plane of a given area at right angle is known as ------------------------------.

BITS, Pilani – Dubai
Dubai International Academic City, Dubai

Course Name : Measurement Technique – I (Biology)　　Max Mark: 40
Course Number: TA C 211　　　　　　　　　　　　　　　Date: 30.12.2009
1st Semester 2009-2010

Name ：	
ID Number:	Section Number:

1. Expand the following abbreviations　　　　　　　(5 X 1 = 5 Marks)
　　　a. BSA　_____
　　　b. TEM　_____
　　　c. SEM　_____
　　　d. PBS　_____
　　　e. TDS　_____

2. Identify the methods mentioned below and fill it in appropriate columns (3X0.5=1.5 Marks)

Protein estimation	Glucose estimation	Yeast cell viability count

- Sudan black method
- Biuret method
- Tryphan blue dye exclusion method
- Haemotoxylin dye method
- Fehling's method
- Mohr's method
- Folin – Wu method

3. Relate the functions / purpose of the following:　　　(5 X 1 = 5 Marks)

a. Rheostat

b. Iris diaphragm

c. Diffraction grating

d. Laminar flow chamber

e. Autoclave

4. Write the scientific names (following Binomial nomenclature) of
　　　a. Onion: . . . . (1 Marks)

　　　b. Beakers yeast: . . . . (1 Marks)

　　　c. Bread mould: . . . . (0.5 Marks)

7. From the following observations calculate the duration of Mitosis & Telophase index (fraction of cells)   (4 Marks)

S No	Stage	No of cells
1	Prophase	7
2	Metaphase	1
3	Anaphase	3
4	Telophase	4
5	Interphase	225

8. Find the chlorinity and salinity of the water sample using the following titrated values.
   - Initial value 18.5ml and final value 18.9ml   (3 Marks)

   - Initial value 18.9ml and final value 19.4ml

   - Initial value 19.4.ml and final value 19.9ml

   - Initial value 19.9ml and final value 20.4ml

9. Illustrate the cell cycle with a suitable diagram (2 Marks)

10. Write the Components of the following: (4X1=4 Marks)

   1. Biuret reagent

   2. Nutrient broth

   3. Fehling's solution A

   4. Fehling's solution B

11. Identify and label the diagram (4X0.5=2 Marks)