ANJUMAN-I-ISLAM'S
AKTC KALSEKAR TECHNICAL CAMPUS
INNOVATIVE TEACHING · EXUBERANT LEARNING

Knowledge Resource & Relay Centre (KRRC)

AIKTC/KRRC/SoP/ACKN/QUES/2013-14/ 83   Date: 13/06/2014

School: __SoP-CBSGS__   Branch: _____   SEM: __III__

To,
Exam Controller,

AIKTC, New Panvel.

Dear Sir/Madam,   (ATKT)

Received with thanks the following **Semester/Periodic** question papers from your exam cell:

Sr. No.	Subject Name	Subject Code	Format		No. of Copies
			SC	HC	
1	Organic Chemistry-I			✓	02
2	Biochemistry-II			✓	02
3	Dispensing Pharmacy			✓	02
4	Pharm. Engg.			✓	02
5	APP-III				
6	Pharm. Math.			✓	02

Note: SC – Softcopy, HC - Hardcopy

(Shaheen Ansari)
Librarian, AIKTC

(3 Hours)   [Total Marks : 70

Note: All Questions are compulsory
      Use of simple calculator is allowed
      Figure at right indicate maximum marks

Q1. (a)   Attempt any 7 [2 marks each]:   [14]

(i)   If A = $\begin{bmatrix} -1 & 2 \\ -3 & 7 \end{bmatrix}$ B = $\begin{bmatrix} 3 & 6 \\ -4 & -1 \end{bmatrix}$ then $2A^T - 3B$ is :

       (a) $\begin{bmatrix} 4 & 7 \\ -19 & 10 \end{bmatrix}$ (b) $\begin{bmatrix} -6 & -9 \\ -3 & 20 \end{bmatrix}$ (c) $\begin{bmatrix} -11 & -14 \\ -17 & 16 \end{bmatrix}$ (d) $\begin{bmatrix} -11 & -24 \\ 16 & 17 \end{bmatrix}$

(ii)   The value of $\int_{-1}^{1}(x + x^2 + x^3 + 1)\, dx$ is:

       (a) 0   (b) 1   (c) 1/3   (d) 2/3

(iii) If A = $\begin{bmatrix} 3 & 1 & 2 \\ 1 & 2 & 3 \\ x & 2 & 4 \end{bmatrix}$ is a singular matrix , then the value of x is:

       (a) 1   (b) 2   (c) 4   (d) 6

(iv)   With respect to Rolle's theorem the value of 'c' corresponding to
       $f(x) = 10 - 6x + x^2$ is:

       (a) 1   (b) 2   (c) 3   (d) 4

(v)   If y = 2x+1, then Δy by taking h = 1 is:
       (a) 0   (b) 1   (c) 2   (d) 3

(vi)   The Nth derivative of f(x) = log (2x+5) is:

       (a) $Y_n = \dfrac{1}{2(2x+5)}$ (b) $Y_n = \dfrac{(-1)^{n-1}(n-1)!2^n}{(2x+5)^n}$ (c) $Y_n = \dfrac{(-1)^n(n)!2^n}{(2x+5)^n}$

       (d) $Y_n = \dfrac{(-1)^n(n-1)!2^n}{(2x+5)^n}$

(vii) General solution for the differential equation $(D^2 - 5D + 6)y = 0$ is:

       (a) $c_1e^{-3x} + c_2e^{2x}$ (b) $c_1e^{2x} + c_2e^{3x}$ (c) $c_1e^{-3x} + c_2e^{-2x}$ (d) $c_1e^{-x} + c_2e^{-2x}$

(viii) The Nth derivative of f(x) = 1/x is:

       (a) $Y_n = \dfrac{1}{x!}$ (b) $Y_n = \dfrac{(-1)^{n-1}(n-1)!}{x^n}$ (c) $Y_n = \dfrac{(-1)^n\, n!}{(x)^{n+1}}$

       (d) $Y_n = \dfrac{(-1)^n(n+1)!}{(x)^{n+1}}$

(ix)   The partial derivative of $Z = 4x^3 + 2xy + x^2y^2$ with respect to y is:

       (a) $2x + 2x^2y$ (b) $4x^3 + 2x + x^2$ (c) $12x^2 + 2y + 2xy^2$ (d) $2x + xy + xy^2$

(b)   Attempt any 1:   [1]

(x)   Which of the following is homogeneous differential equation?
     (a) $f(x,y) = 2x-9y$ (b) $f(x,y) = 3x^2-7y$ (c) $f(x,y) = x^2 + 3y^2-1$ (d) b and c

(xi)   The value of $\int_{-2}^{2} x^3 \, dx$ is: (a) 16/3   (b)8/3   (c) 0   (d) 3/16

Q2. (a)   Attempt any two (4 marks each)   [8]

(i)   Find the Nth derivative of $y = \dfrac{2x+1}{x^2+3x+2}$

(ii)   Using Maclaurin's series, give the expansion of $f(x) = \cos x$

(iii)   Examine the function $f(x, y) = xy(3 - x - y)$ for maxima or minima.

(b)   Attempt any one (3 marks)   [3]

(i)   Verify Lagrange's Mean Value Theorem for $f(x) = x^2 -5x +6$ in [2, 4]

(ii)   If $y = \sin^{-1}x$, prove that $(1-x^2)y_{n+2} - (2n+1)xy_{n+1} - n^2 y_n=0$

Q3. (a)   Attempt any two (4 marks each)   [8]

(i)   Obtain the reduction formula for $\int_0^{\frac{\pi}{2}} Sin^n x \, dx$, hence evaluate $\int_0^{\frac{\pi}{2}} Sin^8 x \, dx$

(ii)   Find the volume of the solid generated by revolving about x-axis and the region bounded by the curve $9x^2 -4y^2 = 36$ in the interval x = 2 to x = 4.

(iii)   Evaluate $\int x \, tan^{-1} x \, dx$

(b)   Attempt any one (3 marks)   [3]

(i)   Find the area bounded by the curve $y = \sin x$ and the x-axis and the line x=0 and $x = \pi$.

(ii)   By using the properties of Definite Integral Evaluate I = $\int_0^{\frac{\pi}{2}} \dfrac{1}{1+tan^2\theta} \, d\theta$

Q4. (a)   Attempt any two (4 marks each)   [8]

(i)   By using the Adjoint method, find the inverse of the matrix $A = \begin{bmatrix} 1 & 2 & 3 \\ 2 & 4 & 5 \\ 3 & 5 & 6 \end{bmatrix}$

(ii)   Find the Eigen values of the matrix $A = \begin{bmatrix} 4 & 1 & -1 \\ 6 & 3 & -4 \\ 6 & 2 & -3 \end{bmatrix}$

Q4. (iii)   Solve by Cramer's rule; $x + y + z = 0$, $2x + 3y - z = -5$, $x - y + z = 4$

(b)   Attempt any one (3 marks)   [3]

(i)   Solve $\begin{vmatrix} 1 & -6 & -x \\ 2 & -3 & x-3 \\ -3 & 2 & x+2 \end{vmatrix} = 0$

(ii)   Find the Rank of the matrix $A = \begin{bmatrix} 1 & 2 & -1 & 2 & 1 \\ 2 & 4 & 1 & -2 & 3 \\ 3 & 6 & 2 & -6 & 5 \end{bmatrix}$

Q5. (a)   Attempt any two (4 marks each)   [8]

(i)   Solve the differential equation $\dfrac{dy}{dx} = \dfrac{x^2 y + xy^2}{x^3 + y^3}$

(ii)   Find the particular solution of $(D^2 + 4D + 4)y = 0$ when x = 0, y = 1 and $\dfrac{dy}{dx} = -1$

(iii)   Solve $(D^2 + 2D + 1)y = 2x + x^2$.

(b)   Attempt any one (3 marks)   [3]

(i)   Form the Differential Equation of y = A cosx + B sinx.

(ii)   Solve the differential equation: x dy+ y dx = 0

Q6. (a)   Attempt any two (4 marks each)   [8]

(i)   By using Newton's Forward Interpolation formula estimate population for the year 1925 from the following data

Year :	1921	1931	1941	1951	1961
Population in thousand: :	46	66	81	93	101

(ii)   Calculate the value of $\int_0^8 x^2 dx$, by using Trapezoidal Rule.

(iii)   Estimate the missing term by using E and Δ from the following:

x:	0	1	2	3	4
y:	1	3	9	--	81

(b)   Attempt any one (3 marks)   [3]

(i)   Evaluate $\left(\dfrac{\Delta^2}{E}\right)$ Sin x.

(ii)   Find $\Delta^2 y$ for $y = 5x^2$, by taking h = 1

Con. 1487-14.

(3 Hours)

[**Total Marks : 70**

N.B. (1) **All** questions are **compulsory**.
   (2) Begin **new** question on a **new page**.

1. (a) Write a note on Bourdon gauge. 3
   (b) Describe mass transfer in turbulent flow. 3
   (c) Enlist the factors affecting caking of crystals. 2
   (d) Explain scale formation. 2
   (e) Explain boiling point diagram of an ideal binary system. 2
   (f) Discuss in brief about thermosetting plastics. 3

2. (a) Classify pumps. Write a note on Rotary pumps. 4
   (b) Explain construction and working of Swenson Walker crystallizer. 4
   (c) Explain distillation of immiscible liquids. 3

3. (a) Differentiate between Orifice and Venturimeter. 4
   (b) Explain condensers as evaporator accessories. 3
   (c) Discuss the components of an absorption type of refrigeration system. 4

4. (a) What is Reynolds experiment ? Give the significance of Reynolds number. 4
   (b) List the types of heat exchangers and write a note on any one tubular heat exchanger. 4
   OR
   (b) What are the different modes of heat transfer ? Write briefly on heat transfer 4
   through solids.
   (c) Discuss in brief Crystal Form and Crystal Habit. 3

5. (a) Discuss the working of centrifugal pumps. 3
   (b) Explain packed columns along with various packings. 4
   OR
   (b) Write in detail on construction and working of fractional distillation column. 4
   (c) Describe in detail fire hazards and the methods for prevention of fire hazards. 4

6. (a) What are conveyers ? Write a note on working of pneumatic conveyers. 3
   (b) Classify evaporators. Explain horizontal tube evaporator. 4
   (c) Define corrosion. Mention in detail any two factors affecting rate of corrosion. 4
   OR
   (c) Enlist methods of combating corrosion. Explain in brief sacrificial anode method 4
   to combat corrosion.

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Con. 1622-14.

Ph. Dispensing

Sem III. CBSGS.

2013-14

QP Code : **BR-1940**

(3 Hours)

[**Total Marks : 70**

N. B. : (1) **All** the questions are **compulsory**.
  (2) **Figures** to **right** indicate **full** marks.

1. (a) Give the following conversions :-   2
      (i) 5 grains   = _____ mg.
      (ii) 100 minims = _____ ml.
      (iii) 3 litres   = _____ floz.
      (iv) 15 kg   = _____ lb.
   (b) State the type of powders for which double wrapping is used. Justify.   2
   (c) Calculate the dose of a drug for a child of 6 years if the adult dose is 250 mg.   1
   (d) Write a note on vehicles used in formulations of liniments.   2
   (e) Why are inhalations dispensed as suspensions rather than as emulsions.   2
      Mention the directions for use of inhalations.
   (f) Define emulsions ? Enlist the different types of emulsions. Give examples of   2
      each type.
   (g) Classify bases used in the manufacture of pastes. Give suitable examples of   2
      formulations manufactured using each type of base.
   (h) Give advantages of using capsules as a solid unit dosage form.   2

2. (a) Enlist the various methods for the preparation of ointments. Describe in detail   4
      the method for incorporation of insoluble solids into ointments.
   (b) (i) Comment on the following prescription :-   2
         Rx
         Phenytoin sodium - 50 mg.
         Send 5 capsules.
         Label :- One to be taken three times a day.
      (ii) Write a note on moulded tablets   2
   (c) How many ml of 1:5000 w/v solutions of the preservative Lauralkonium   3
      chloride can be made from 125 ml of 0.2% solution ?
      Calculate the dilution factor for the same
            OR
      How will you prepare 20 g of diflucortolone valerate ointment 0.025% w/w
      from a 0.1% w/w ointment and unmedicated base.

3. (a) Answer the following questions :-
      (i) What are enemas ? Mention the types of drugs that are usually   2
         incorporated into enemas.
      (ii) What are the advantages of solutions used orally ?   2
   (b) Describe the different methods of preparation, packing and dispensing of   4
   pills.
            OR
      Write a note on preparation, packing and dispensing of Lozenges.

     (c) Write a note on liquid soap emulsions. Mention the type of emulsion formed   3
with each type of soap.

4. (a) Answer the following questions :-
           (i)   Draw an imaginary prescription and label its parts.   2
           (ii) Define :- (1) Gargles (2) Draughts.   2
     (b) Discuss the method for compounding of suspensions of precipitate forming   4
liquids.
     (c) Comment on the following prescription :-   3

           Rx
           Arachis oil - 50 ml
           Peppermint emulsion, concentrated - 5 ml
           Chloroform water, double strength - 100 ml
           Water to - 200 ml
           Make an emulsion.
           Label : Three 5 ml spoonfuls to be taken three times a day with
           meals.

5. (a) Discuss theobroma oil as a suppository base.   4
     (b) What are the incompatibilities of soluble benzoates and salicylates.   4
     (c) Calculate the concentration of sodium chloride required to render a 1.5%   3
solution of Cocaine hydrochloride iso osmotic with blood fluids.
Freezing point of 1% solution of Cocaine hydrochloride = -0.09°C.
Freezing point of 1% solution of Sodium chloride = -0.576°C.
                      OR

Find the concentration of dextrose required to make a 0.12% solution of
sodium chloride iso-osmotic with blood plasma.
Mol wt of Dextrose = 180
Mol wt of sodium chloride = 58.5

6. (a) Mention the container/closure system and labelling directions of any **one** of   2
the following :-
           (i) Creams   (ii) Mouthwashes.
     (b) Give English translations of :-   2
           (i) Pillula   (ii) Hebdomada
           (iii) Ungentum   (iv) Infricandus.
     (c) In what proportion will you mix Twein 80(HLB 15) and span 80(HLB 4.3) to   2
obtain 100 g of an emulgent having an HLB of 8.
     (d) What are stock solutions ? Differentiate between recently prepared and freshly   3
prepared solutions.
   (e) Describe any one method for small scale compounding of suppositories.   2

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Sem III CBSGS.

2013-14

QP Code : BR-1934

18-3-14

(3 Hours)   [Total Marks : 70

N.B.: 1. All Questions are compulsory
**2. Figures to right indicate full marks**

Q1) Answer the following questions:

a) Nomenclate the following molecules as per IUPAC rules. (Assign E/Z or R/S or D/L notations wherever applicable) (Any four): (04)
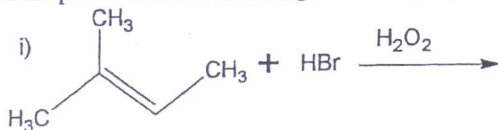
i)

ii) OHC

iii)

iv)

v)
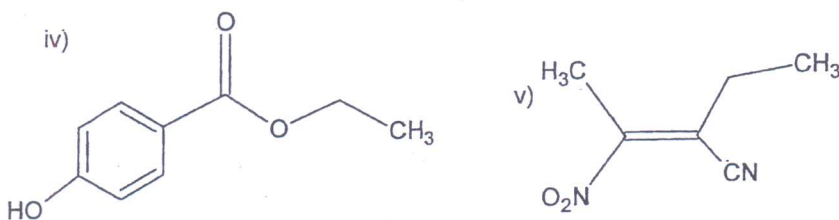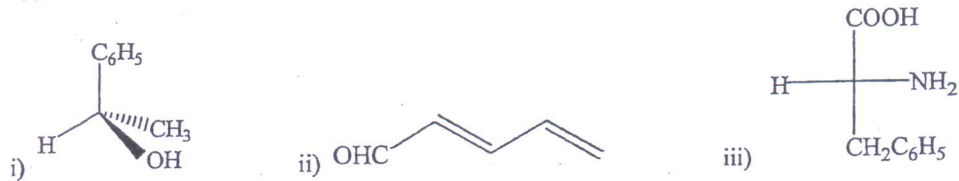
b) Arrange the following in increasing order of acidity. Justify. (02)
   Acetic Acid, Trifluroacetic acid, Monochloroacetic acid

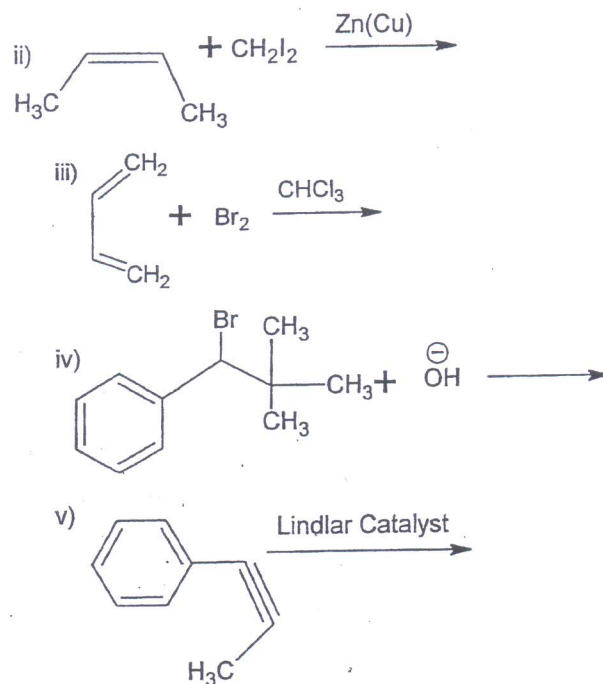c) Write resonating structures for the following molecules. (02)

i)   ii)
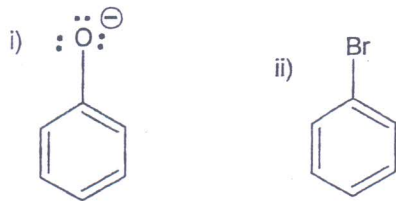
d) Identify whether the following molecules are chiral or achiral. Justify. Mark the asymmetric carbon. (02)

i)   ii)
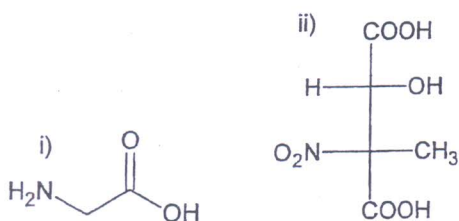
e) Give the products of the following reactions (Any three): (03)

i)

ii)

$$H_3C-CH=CH-CH_3 + CH_2I_2 \xrightarrow{Zn(Cu)}$$

iii)

$$\underset{CH_2}{\overset{CH_2}{\|}} + Br_2 \xrightarrow{CHCl_3}$$

iv)

$$C_6H_5-CH_2-\underset{Br}{\overset{}{C}}H-\underset{CH_3}{\overset{CH_3}{\underset{|}{C}}}-CH_3 + \overset{\ominus}{OH} \longrightarrow$$

v)

$$C_6H_5-C\equiv C-CH_3 \xrightarrow{Lindlar\ Catalyst}$$

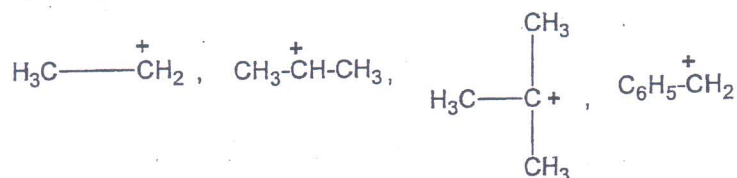F) Explain the Term: i) Chirality ii) Configuration   (02)

Q2. a) Define Tautomerism. Comment on tautomerism of vinyl alcohol?   (02)

b) Arrange the following sets of carbocations in increasing order of stability and justify the same.   (02)

$$H_3C-\overset{+}{C}H_2 \ , \quad CH_3-\overset{+}{C}H-CH_3 \ , \quad H_3C-\underset{CH_3}{\overset{CH_3}{\underset{|}{\overset{|}{C}}}}\overset{+}{} \ , \quad C_6H_5-\overset{+}{C}H_2$$

c) Discuss SN^1 reaction proceeds with racemization and inversion of configuration.   (04)

d) i) Write a note on Peterson's Reaction   (02)
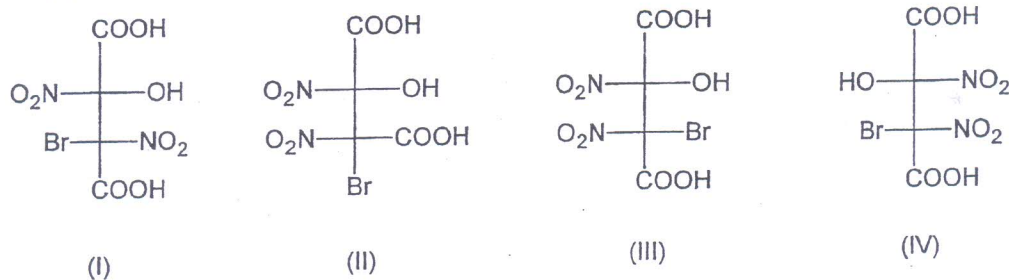
ii) Give the example of dimerization of alkene.   (01)

Q3a) i) Identify the relationship of molecule (i) with (ii), (iii) and (iv):   (02)

(I)   (II)   (III)   (IV)

ii) What are enantiomers? Give suitable example.   (02)

b) Discuss isotope effect and element effect that affect rate of elimination reaction.   (04)

c) Using suitable chemical reagents, suggest a method for synthesizing the following alkenes.   (03)

i) Ethylmethylcyclopropane, ii) 3-Bromocyclohexene, iii) 2-Bromo-3-methylpentane.

Q4a) Explain how –OCH$_3$ group behaves as ortho, para director in electrophilic substitution reaction?   (02)

b) Write the mechanism of sulphonation reaction of Toluene.   (02)
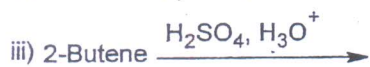
c) Bring about the following conversions.   (04)

i) 1, 1-Dichloropropane to Propyne

ii) 1-Methylcyclohexene to trans- 1-methyl-2-cyclohexanol

iii) Pent-3-en-2-one to Diethyl (1-methyl-3-oxobutyl)malonate

iv) 2,3-Dichloro-2-phenylbutane to 2-Phenylbutan-2-ol

d) Give the products for the following reaction. (Any Three)   (03)

i) $(C_2H_5)_2$CuLi + Ethylbromide $\longrightarrow$

ii) Acetylene + Phenylmagnesium Bromide $\xrightarrow{\text{Dry THF}}$

iii) 2-Butene $\xrightarrow{H_2SO_4, H_3O^+}$

iv) 2-Hydroxy-2-methylpentane $\xrightarrow[\text{Heat}]{H_2SO_4}$

Q5a) What are meso compounds? Are they optically active?   (02)

b) Suggest a suitable method for the resolution of mixture of neutral compounds.   (02)

c) Whether following molecules are aromatic/nonaromatic/antiaromatic. (Any Four)   (04)
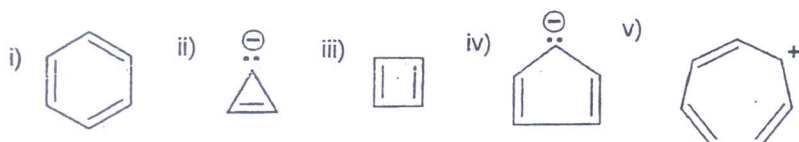
d) Give the mechanism for nucleophilic substitution reaction of benzene.   (03)

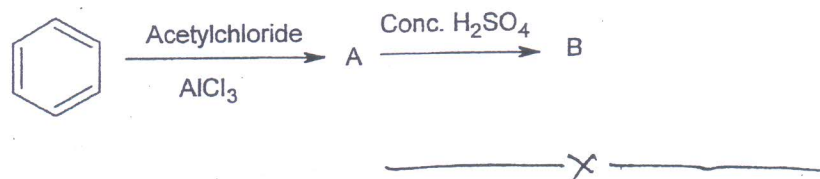Q6a) Explain the stereochemistry of addition of bromine to Cis- 2-methyl-2-butene.   (02)

OR

a) Account for the formation of cis-2, 3-butanediol and trans-2,3-butanediol from 2-butene.   (02)

b) Bromination of methane is more selective than chlorination. Justify.   (02)

[TURN OVER

Con. 2458-14.

c) Give the major product formed on addition of HBr on 1, 3-Cyclohexadieneand Justify the answer.   (02)

d) Predict the product of the reaction of propylene with mercuric acetate in methanolic solution, followed by reduction with sodium borohydride.   (03)

e) Identify the A,B in the following reaction.   (02)

Con. 2458-14.

Biochem II

2013-14

em III (CBSGS)

QP Code : **BR-1937**

20-3-14

(3 Hours)

[Total Marks : 70]

N.B. : **All** questions are **compulsory**.

1. (a) Give the function of "Primase" in DNA replication.   1
   (b) Define "Glycolysis".   1
   (c) Write the role of Phophofructokinase in glycolysis.   1
   (d) Draw the structure of Adenine.   1
   (e) What are ketone bodies.   1
   (f) Name the enzyme involved in Proof Reading activity during DNA replication.   1
   (g) Name the initiation codon and its respective amino acid.   1
   (h) Write the functions of Cholesterol.   2
   (i) Name two drugs inhibiting purine biosynthesis.   2
   (j) Explain proton motive force.   2
   (k) List the drugs inhibiting translation process.   2

2. (a) Define Glycogenesis and discuss in brief reactions involved in it.   4
   (b) Write the mechanism of transport of acyl CoA into mitochandria during β-oxidation of fatty acids.   4
   (c) Discuss in brief Solid phase peptide synthesis.   3

3. (a) Give the names and structures of the substrates and products of the following enzyme reactions. (any **two**)   4
       (i) Citrate Synthase
       (ii) Phosphogluconate dehydrogenase
       (iii) Succinate dehydrogenase.
   (b) Write the structures of the given substrate and product and name the enzyme catalyzing the reaction (any **two**) :—   4
       (i) Acetoacyl CoA $\rightarrow$ HMG CoA
       (ii) α–D–Ribose–5–phosphate $\rightarrow$ 5–phosphoribosyl α–pyrophosphate
       (iii) Xanthosine monophosphate $\rightarrow$ Guanosine monophosphate
   (c) Draw a neat labelled diagram of replication fork.   3

4. (a) (i) Enlist the components of ETC.   1
       (ii) Differentiate between oxidative phosphorylation and substrate level phosphorylation.   3
   (b) (i) Write a comment on regulation of fatty acid synthesis.   2
       (ii) Give the functions of ketone bodies.   2
   (c) Explain Sanger dideoxy method for DNA sequencing.   3

[TURN OVER

5. (a) Describe post-translational modifications of protein.   4
   (b) Describe the transcription termination process in eucaryotic cell.   2
   (c) Write a note on solid phase DNA synthesis.   3
   (d) Draw the structure of phosphatidic acid or 1, 2 – Diacylglycerol.   2

6. (a) Draw Embden Meyerhoff Pathway.   3
   (b) Write pyrimidine biosynthesis in detail.   4
   (c) Briefly discuss peptide sequencing.   3
   (d) Enlist the telomerase inhibitors.   1