QP Code :13733

Duration: 3 Hrs

Maximum 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 $A = \begin{bmatrix} 2 & 3 \\ -5 & -7 \end{bmatrix}$ then the inverse of A is : (a) $\begin{bmatrix} -7 & -3 \\ 5 & 2 \end{bmatrix}$ (b) $\begin{bmatrix} -2 & 3 \\ -5 & 7 \end{bmatrix}$ (c) $\begin{bmatrix} 2 & -5 \\ 3 & -7 \end{bmatrix}$ (d) $\begin{bmatrix} 2 & 5 \\ -3 & -7 \end{bmatrix}$	
	(ii)	The value of $\int_0^1 (2x + 3x^2 + 4x^3 + 1)\, dx$ is: (a) 0 (b) 1 (c) 3 (d) 4	
	(iii)	If $A = \begin{bmatrix} k & k & 4 \\ 3 & 1 & 2 \\ 1 & 2 & 3 \end{bmatrix}$ is a singular matrix , then the value of k is: (a)5/4 (b) 5/2 (c) 15/4 (d) 40/8	
	(iv)	The Rolle's theorem is defined on a function which should be : (a) Continuous on the closed interval [a,b] (b) Continuous on the open interval (a, b) (c) Derivable in the open interval (a, b) (d) both a and c	
	(v)	If $y = x^2$, then $\Delta^2 y$ by taking h = 1 is: (a) - 1 (b) 1 (c) 2 (d) -	
	(vi)	The Nth derivative of $f(x) = \frac{1}{4x+9}$ is: (a) $Y_n = \frac{(-1)^{n+1}(n)!4^n}{(4x+9)^{n+1}}$ (b) $Y_n = \frac{(-1)^n(n)!4^n}{(4x+9)^{n+1}}$ (c) $Y_n = \frac{(-1)^n(n)!4^n}{(4x+9)^n}$ (d) $Y_n = \frac{(-1)^n(n+1)!4^n}{(4x+9)^{n+1}}$	
	(vii)	General solution for the differential equation $(D^2 - 5D + 6)y = 0$ is: (a) $c_1 e^{-3x} + c_2 e^{2x}$ (b) $c_1 e^{2x} + c_2 e^{3x}$ (c) $c_1 e^{-3x} + c_2 e^{-2x}$ (d) $c_1 e^{-x} + c_2 e^{-2x}$	
	(viii)	The rank of the matrix $A = \begin{bmatrix} 1 & 2 & 3 \\ 4 & 5 & 6 \\ 7 & 8 & 9 \end{bmatrix}$ is: (a) 0 (b) 1 (c) 2 (d) 3	
	(ix)	For $f(x, y) = x^2 + xy + y^2$, the value of $\frac{\partial^2 f}{\partial x^2}$ is: (a) 2x + y (b) 1 (c) 2 (d) x + 2y	
	(b)	Attempt any 1:	[1]
	(x)	Which of the following is not a homogeneous differential equation? (a) $f(x, y) = 2x-9y$ (b) $f(x, y) = 3x^2-7y^2$ (c) $f(x, y) = x^2 + 3y^2-1$ (d) a and b	
	(xi)	The value of $\int_{-2}^2 x^5\, dx$ is: (a) 16/3 (b)8/3 (c) 0 (d) 3/16	

[TURN OVER

Q2.	(a)	Attempt any two (4 marks each)	[8]
	(i)	Find the Nth derivative of $y = \sin^3 x$	
	(ii)	Using Taylor's series, expand $f(x) = \sin x$ in ascending powers of $(x - \pi/2)$	
	(iii)	If $u = y.\sin(x.y)$, then show that $y\dfrac{\partial u}{\partial y} - x\dfrac{\partial u}{\partial x} = u$	
	(b)	Attempt any one (3 marks)	[3]
	(i)	Verify Rolle's theorem for the function $f(x) = x^3 - x^2 - x + 1$ on $[-1, 1]$.	
	(ii)	Differentiate the equation $(1 + x^2)y_2 - xy_1 + y = 0$, 'n' times with respect to x.	
Q3.	(a)	Attempt any two (4 marks each)	[8]
	(i)	Obtain the reduction formula for $\int \sin^n x \, dx$	
	(ii)	The loop of the curve $y^2 = x(x-1)^2$ rotates about x-axis. Find the volume of the solid formed.	
	(iii)	Prove that $\int_0^{\pi/2} \log(\tan x)\, dx = 0$.	
	(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)	Using the properties of Definite Integral, show that $\int_{-\pi/2}^{\pi/2} \sin 3x.\cos 5x \, dx = 0$	
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)	Evaluate $A = \begin{bmatrix} 265 & 240 & 219 \\ 240 & 225 & 198 \\ 219 & 198 & 181 \end{bmatrix}$ by using the determinant properties.	
	(iii)	Solve by Cramer's rule; $x + 2y + z = 12$, $2x + y + z = 11$, $x + y + 2z = 1$	

[TURN OVER

	(b)	Attempt any one (3 marks)	[3]
	(i)	Solve the equation $\begin{vmatrix} 1 & -6 & -x \\ 2 & -3 & x-3 \\ -3 & 2 & x+2 \end{vmatrix} = 0$	
	(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 $\sec^2 x.\tan y\, dx + \sec^2 y.\tan x\, dy = 0$	
	(ii)	Find the particular solution of $(D^2+D-2)y = 0$ when x = 0, y = 1 and $\frac{dy}{dx}=0$	
	(iii)	Solve $(D^2 +3D +2)y = x+x^2$.	
	(b)	Attempt any one (3 marks)	[3]
	(i)	Form the Differential Equation of $x^2 + y^2 = a^2$, where a is an arbitrary constant.	
	(ii)	Solve the differential equation: $x\frac{dy}{dx} = y - x$	
Q6.	(a)	Attempt any two (4 marks each)	[8]
	(i)	By using Lagrange's Interpolation formula estimate y when x = 4 from the following data X: 0 2 5 6 Y: 7 11 17 19	
	(ii)	The value of a function f(x) for certain values of x are given below. 	x	0	2	4	6	8	10	 |---|---|---|---|---|---|---| 	f(x)	-3	1	13	33	61	97	 Use Simpson's 1/3 rd Rule to find $\int_0^{10} f(x)\, dx$.	
	(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 $\left(\frac{\Delta^2}{E}\right)$Sin x.	
	(ii)	Given: x : 1 2 4 F(x): 2 6 24 Estimate f(3) by constructing the difference table and making a suitable assumption.	

S.Y. B. Pharm. SEM-III CBSGS

APP-III

2014-15

QP Code : 13729

(3 Hours)   [Total Marks : 70

N.B. (1) **All** questions are **compulsory**.
(2) **Figures** to the **right** indicate full **marks**.
(3) Draw neat labelled **diagrams** wherever **necessary**.

1. (a) Answer the following :—   12
    (i)   Define stroke volume and enlist the factors affecting stroke volume.
    (ii) Define "tachycardia" and "bradycardia".
    (iii) What is the role of major and minor Calyces in the Kidneys ?
    (iv) Name the hormones that regulate water reabsorption in nephrons.
    (v)   Name the salivary glands and what is the composition of saliva ?
    (vi) What are the causes of peptic ulcers ?

    (b) (i)   The aortic and pulmonary valves are known as the _____ .   3
    (ii) Kidney processes blood received from the _____ .
    (iii) _____ cells secrete pepsinogen and gastric lipase.

2. (a) Answer any **two** :—   8
    (i)   Draw a neat labelled diagram of section of uterus.
    (ii) What are the secretions of prostate and seminal gland ? State their role.
    (iii) Write a note on Sexually transmitted diseases.

    (b) Answer any **one** :—   3
    (i)   Discuss the physiological role of testosterone.
    (ii) Write a note on influence of pituitary hormones on the Ovarian changes.

3. (a) Answer any **two** :—   8
    (i)   Draw a neat and labelled diagram of external anatomy of the heart
          indicating the entry and exit of the great vessels and state the functions
          of cardiovascular system.
    (ii) Describe cardiac cycle in detail.
    (iii) Discuss the pathophysiology of Angina Pectoris.

    (b) Answer any **one** :—   3
    (i)   Write a note on Hormonal regulation of blood pressure.
    (ii) Describe the unique structural features of capillaries and state its functions.

4. (a) Answer any **two** :—   8
    (i)   Draw a neat and labelled diagram of nephrons.
    (ii) Discuss absorption and secretion in the distal convoluted tubule and
          collecting duct.
    (iii) Discuss the functions of Liver.

    (b) Answer any **one** :—   3
    (i)   Define : Hypokalemia, Hypernatremia, hypervolemia.
    (ii) Discuss the pathophysiology of renal calculi.

[TURN OVER

5. (a) Anwer any **two** :—   8
       (i) Describe the phases of digestion.
      (ii) Draw a neat and labelled diagram of section of small intestine.
    (iii) Write a note on Carbohydrate digestion and absorption across the GI tract.
  (b) Answer any **one** :—   3
       (i) Write a note on Hepatitis.
      (ii) Discuss the pathophysiology of Crohn's disease.

6. (a) Answer any **two** :—   8
       (i) Explain in detail vascular resistance.
      (ii) Name the different cells lining the internal lining of the stomach and give their physiological functions.
    (iii) Explain action potential in myofibrils.
  (b) Answer any **one** :—   3
       (i) Discuss the risk factors for coronary artery diseases.
      (ii) Describe autonomic regulation of heart rate.

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Sem-II CBSGS [ph. Engg]
2014-15

QP Code :13726

(3 Hours) [Total Marks : 70]

N.B.: (1) **All** questions are **compulsory**.

(2) Begin new question on a **new page**.

1. (a) With neat and labelled diagram differentiate between simple manometer and differential manometer.   3

   (b) Explain "turbulent flow" and "laminar flow" in mass transfer.   3

   (c) Mention different factors affecting cyrstallisation.   2

   (d) Explain parameters required to control rate of evaporation.   2

   (e) Write a note on equilibrium distillation.   2

   (f) Explain Nickel and its alloys in brief.   3

2. (a) Give the classification of pumps and in brief explain reciprocating pump.   4

   (b) Explain with neat and labelled diagram Oslo Crystallizer.   4

   OR

   (b) Explain in detail any one crystallizer which achieves supersaturation by cooling.

   (c) Discuss the construction and working of centrifugal molecular still.   3

3. (a) Classify flowmeters and discuss the principle of pressure differential flowmeter.   4

   OR

   (a) Classify flowmeters and wirte a short note on Rotameter.

   (b) Enlist evaporator accessories and discuss condensor used in evaporation.   3

   (c) Give the applications of Refrigeration and explain brine system.   4

4. (a) Explain an experiment to study "laminar flow" and "turbulent flow" in Fluids.   4

   (b) Define convection and write a note on Stefan Boltzmann Law.   4

   OR

   (b) Write a short note on shell and tube heater.

   (c) Define "Crystal habit" and explain the stage of "Supersaturation".   3

[TURN OVER

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5. (a) With neat and labelled diagram discuss centrifugal pump.   3
   (b) Discuss in detail columns used in Fractional distillation.   4

   OR

   (b) Discuss in detail distillation of Miscible liquids.
   (c) Explain preventive measures to be taken for different types of Mechanical Hazards.   4

6. (a) Give the classification of conveyors and explain Bucket conveyor in detail.   3
   (b) Give the classification of evaporator and discuss in detail falling film evaporator.   4
   (c) Name different types of corrosion and discuss any two methods to prevent corrosion.   4

   OR

   (c) Explain corrosion reaction on single metal and between two metals.

----

4. (a) Draw an imaginary prescription and label its parts. Add a note on pricing of   4
        prescriptions.
    (b) Discuss the method for compounding of suspensions containing precipitate forming   4
        liquids.

OR

What are the ideal properties of a good suspension. Distinguish between suspension
containing diffusible solids and indiffusible solids.

    (c) Comment on the following prescription.   3
        R_x

Calciferol solution	- 0.15 ml
Glycerin	- 0.3 ml
Warer to make	- 5 ml
Label : 5 ml daily	

5. (a) Discuss macrogols as suppository bases.   4

OR

Discuss the disadvantages of theobroma oil as suppository base.

    (b) Discuss the different types of physical incompatibility in detail.   4
    (c) Find the concentration of dextrose to make a 0.12% solution of sodium chloride   3
        iso-osmotic with blood plasma.
        Molecular weight of sodium chloride - 58.5
        Molecular weight of Dextrose - 180

6. (a) Give the labelling instructions for any **two**.   2
            (i) Ear drops   (ii)   Enemas   (iii)   Pills.
    (b) Give English translations of :—   2
            (i) Si opus sit
            (ii) More dicto
            (iii) Hebdomada
            (iv) Cras vespere
    (c) How are proprietary medicines dispensed?   3
    (d) The required HLB of an emulsion is 11. What amount of span 80 (HLB 4.3) and   2
        Tween 80 (HLB 15) should be used if the total quantity of emulgents is 150g.
    (e) Define displacement value. What is the significance of displacement value.   2

QP Code : **13719**

(3 Hours) [**Total Marks : 70**

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

1. (a) Define 'Glycolysis' 1
   (b) The key regulatory enzyme of cholesterol biosynthesis is _____. 1
   (c) How many $FADH_2$ molecules are produced after 6 turns of β-oxidation pathway. 1
   (d) Give the names of ETC components. 1
   (e) Glycolysis in erythrocytes leads to lactate production - True or False. 1
   (f) Draw the structure of purines. 2
   (g) Name any two drugs inhibiting RNA polymerase. 2
   (h) Enlist ketone bodies and draw structure of any one. 2
   (i) Name two drugs inhibiting translation process. 2
   (j) Name any two diseases due to disorders of purine metabolism. 2

2. (a) Explain Embden-Meyerhof pathway. 4
   (b) Write a note on post-transicriptional modifications. 4
   (c) Draw the salvage pathway of purine nucleotide synthesis. 3

3. (a) Give the name & structures of the substrate & product of the following enzyme. 4
       reactions. (any **two**) :–
           (i) isocitrate dehydrogenase
           (ii) Gluconolactone hydrolase
           (iii) Enoyl CoA hydratase
   (b) Write the structures of the given substrate & product & name the enzyme. 4
       Catalyzing the reaction (any **two**) :–
           (i) Phosphatidic acid → 1,2- diacylgycerol
           (ii) Inosine monophosphate → Xanthosine monophosphate.
           (iii) Glyceraldehyde 3- phosphate → fructose 6 phosphate
   (c) Explain peptide sequencing by Edman method. 3

4. (a) Explain proton motive force 2
   (b) Write the functions of cholesterol 3
   (c) Explain DNA polymorphism. Give example of its involment in disease state. 3
   (d) Explain modification of primary transcript of mRNA. 3

5. (a) Explain substrate level phosphorylation with example. 3
   (b) Explain metabolic pathway for the synthesis of pyrimidine nucleotide. 4
   (c) Describe DNA replication in prokaryotics. 4

6. (a) Write a note on telomeres and telomerase. 3
   (b) Explain DNA sequencing by Sangar's method. 4
   (c) Describe initiation and elongation of protein biosynthosis. 4

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Course   :   S.Y.BACHELOR OF PHARMACY (SEM-III) [CBSGS](PROG 297)

Q.P Code   :   13719

Correction   :

Q.2 (b) Read as post- translational modifications instead of post-
          transcipitional modification

Query Update time : 10/12/2014 11:20 am

PHC3036
Shaikh

PHC3037
Fideh

/ PHC3001
Solmant

PHC3019
Rkrfaldew Corn

Sem - III CBSGS . OC-I

① 2014-15

(3 Hours)

QP Code : 13716

N.B.: 1. All questions are compulsory

Total Marks: 70

2. Figures to right indicate full marks

Q1) A] Answer the following questions (12)
a. Assign E/Z or R/S or D/L notations and nomenclate the following molecules as per IUPAC rules (Any Two):

i)   ii)   iii)
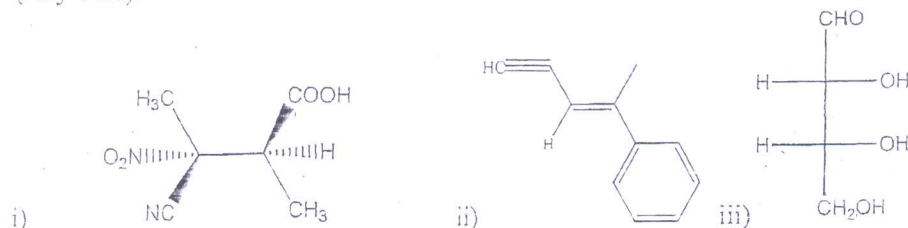
b. Give suitable structures for the following compounds (Any Two):
i. 2-Hydroxycyclopentanecarboxamide
ii. 4-Methylbenzenesulfonic acid
iii. Ethyl 2-methylpropanoate

c. Draw possible resonating structures for the following compounds
Anisole and phenol

d. Rank the order of basicity for the following organic compounds and justify
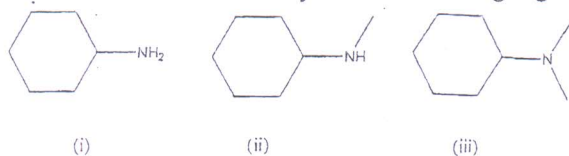
e. Rank the order of acidity for the following alcohol protons (-O$\underline{H}$) and justify
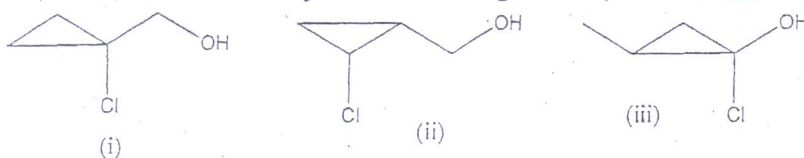
f. Establish the relationship between following pair of molecules
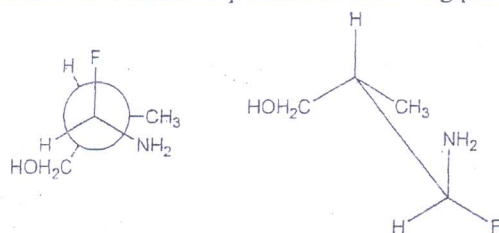
B] Give the products of the following reactions (Any Three): (03)

BN-Con. 10389-14.

[TURN OVER

i) $\xrightarrow{\text{N-Bromosuccinimde}}$

ii) $\xrightarrow{\text{H}_2/\text{Pd/quinoline}}$

iii) $\xrightarrow[\text{H}_3\text{O}^{\oplus}]{\text{CH}_3\text{CO}_2\text{OH}}$

iv) Acetone $\xrightarrow[\text{CH}_3\text{Li}]{\text{H}_3\text{C}-\langle\rangle-\text{SO}_2\text{NHNH}_2}$
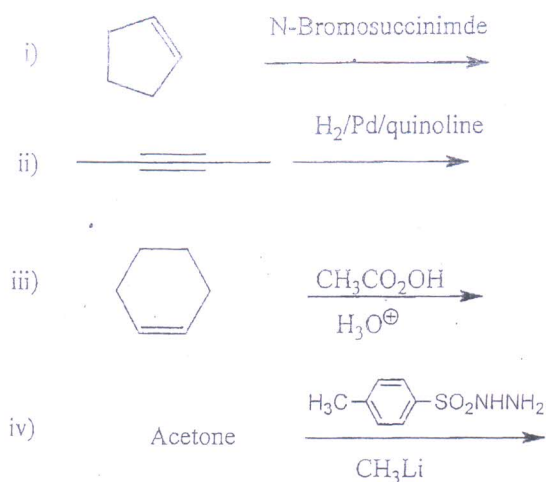
Q2.A) Identify the tautomeric system existing in the following pair of molecules   (01)

B)   Identify all the nucleophiles in the given reaction   (01)

$(CH_3)_2\overset{\oplus}{N}H_2 + CH_3\overset{..}{\underset{..}{O}}:^{\ominus} \longrightarrow (CH_3)_2NH + CH_3OH$

C) Answer the following questions: (06)

i) Arrange the following sets of carbanions in increasing order of stability and justify the same:

ii) Explain the stereochemistry of hydroxylation of trans 2-butene using osmium tetroxide.

iii) Give the structures of A and B in the following reaction:
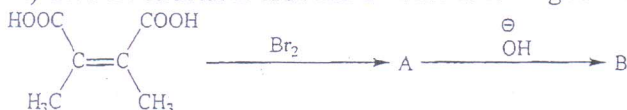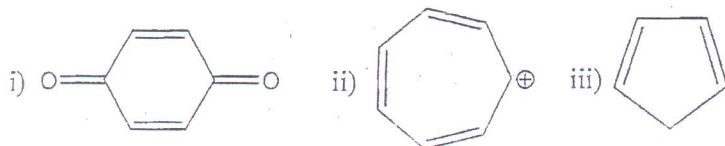
D) Complete the following table: (03)

	Example of the nucleophile	Type of solvent	Example of ideal solvent
S_N1 reaction			
S_N2 reaction			

Q.3 A) What are mesomers? Are they optically active? Give suitable example.   (01)

B) Represent 2(S), 3(S)- 2,4-Dihydroxy-3-nitrobutanal using various projection formulae.   (02)

C) What is Saytzeff's rule? Givethe mechanism for dehydrohalogenation reaction of neopentyl bromide using alcoholic sodium hydroxide.   (04)

D) Give probable structures for the following   (04)

i) An alkene yielding 2 moles of acetone on ozonolysis

ii) A product obtained on addition of HBr to Propene

iii) An alkene obtained on dehydration of 2-Methyl-2-butanol

iv) A product obtained on addition of isobutane to isobutylene in presence of acid catalyst

Q.4 A) Discuss the orientation and reactivity of the –OH group towards electrophilic aromatic substitution.   (02)
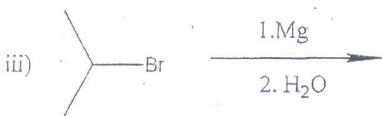
[TURN OVER

E) As written, the following syntheses have flaws. What is wrong with each?   (03)

i)

1. HNO_3, H_2SO_4
2. CH_3COCl, $AlCl_3$

Toluene

1. Cl_2. $FeCl_3$
2. $KMnO_4$

ii)   Chlorobenzene

1. HNO_3, H_2SO_4
2. CH_3Cl, $AlCl_3$
3. $NaNH_2$, Liq. NH_3

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