DARSHAN ACADEMY
Holiday Homework (2018-19)
Class: XII(Science)
Subject: English Core

ADVANCED WRITING SKILLS

(1) You are Neeti, Secretary, Himachal Handicrafts Association. Write a notice regarding a Mega Sale to be organized in the first week of October on the occasion of Diwali in not more than 50 words.

(2) CPR Senior Secondary School, Meerut is looking for a receptionist for its school. Draft an advertisement in not more than 50 words to be published in classified columns of 'The Hindustan Times'. You are Romola Vij, Principal of the school.

(3) As the Secretary of the Literary Club of St. Annie's School, Ahmedabad, draft a formal invitation to invite parents for the inauguration of the club in your school. (word limit: 50 words)

(4) You have been invited by your friend to attend the festivities of the wedding of his brother. Draft a suitable informal reply in not more than 50 words accepting the invitation.

(5) There was a talk on the issue of co-education on the radio. After listening to various views on the topic you decide to write an article on 'The Advantages of Co-education' for your school magazine. Write an article in 150-200 words.

(6) The recent Board paper leak cases of classes X & XII has resulted in retest of some subjects. This has caused panic and trauma among the students and their parents. As a concerned citizen, write a letter to the Editor of national daily expressing your concern in this regard.

(7) You are perturbed as regards to the nation-wide agitation for reservation. The violence and protests in the nation has forced to think over the issue whether to favour it or oppose it. Write a speech on the topic 'Reservation – a serious issue' to be delivered in the morning assembly.

FLAMINGO (Poems & Prose texts)

1. MY MOTHER AT SIXTY SIX - *Kamala Das*

1) What different images does the poet use to convey the idea of her mother's old age?

2) What is the poet's familiar ache and why does it return?

3) Why does the poet smile and what does she say while bidding goodbye to her mother?

2. AN ELEMENTARY SCHOOL CLASSROOM IN A SLUM- *Stephen Spender*

1) What is expected of the governor, inspector and visitor and why?

2) What is the social issue that the poet raises in the poem?

3) Which world do the slum children belong to? Which world is inaccessible to them?

3. KEEPING QUIET- *Pablo Neruda*

1) Does the poet suggest total inactivity or death or something else? Give reasons.

2) How do few moments of introspection affect our lives?

3) What is the 'exotic moment'? Why?

4. THE LAST LESSON - *Alphonse Daudet*

1) How was the order from Berlin going to make a difference to the lives of the students?

2) Whom does the teacher blame for ignoring the learning at school and why?

3) In the story M. Hamel emerges not only as a dedicated teacher but also as a sensitive and understanding human being. Elaborate the character of M. Hamel in light of the above statement.

5. THE LOST SPRING: STORIES OF STOLEN CHILDHOOD - *By Anees Jung*
1) How did Saheb get tennis shoes? Why does he explain the author how he had got them?
2) 'Survival in Seemapuri means rag picking'. Give a detailed account of the life and activities of the refugees from Bangladesh settled in Seemapuri.
3) The life of bangle makers of Firozabad was full of obstacles which forced them to lead a life of poverty and deprivation. Elaborate.

6. DEEP WATER – By *William Douglas*
Short answer questions:
1) Why couldn't Douglas implement his strategy of escaping drowning?
2) What are the quality traits of the swimming instructor who helped Douglas overcome his fear of water?
3) Mention any two long term consequences of the drowning incident on Douglas.
4) What are the series of fear and emotions Douglas experienced while he was drowning in the YMCA pool? How did he face the near-death experience?

7. THE RATTRAP – By *Selma Lagerlof*
1) How was the iron master's reaction to the peddler different from that of the blacksmith?
2) Why did Edla insist on entertaining the peddler even after he was exposed?
3) What did the gift of the rat trap signify? Why was Edla happy to see the gift left by the peddler?
4) 'A simple act of mercy and kindness can bring about a change of heart.' Discuss the significance of love and kindness with reference to the story 'The Rattrap'.

Long Reading Text (The Invisible Man)
Read the novel (chapters 1- 15) and answer the following questions:
1) What impressions do you form of the stranger by his strange appearance and the intermittent conversation with Mrs. Hall?
2) Mrs. Hall tried to prove the best of hosts but the regular snubbing on the part of the stranger frustrated all her efforts. Comment.
3) What made Mrs. Hall change her opinion about the stranger and what change do you notice in her attitude towards the stranger?
4) What difference do you find in Mrs. Hall's treatment of the stranger and her husband?
5) What made Cuss interview the stranger? What was the outcome of the interview?
6) Describe the burglary at vicarage.
7) Why did the invisible man choose Mr. Marvel as his helper and why did Mr. Marvel comply?
8) Describe the episode when the people of Iping realized that the stranger was an invisible man.
9) Describe the invisible man's encounter with the village constable, Bobby Jaffers.
10) What created commotion in the street when a great rush of people poured out from the 'Coach and Horses' on Whit Monday? How did it help Marvel in escaping?
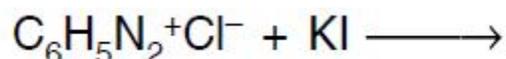
CHEMISTRY

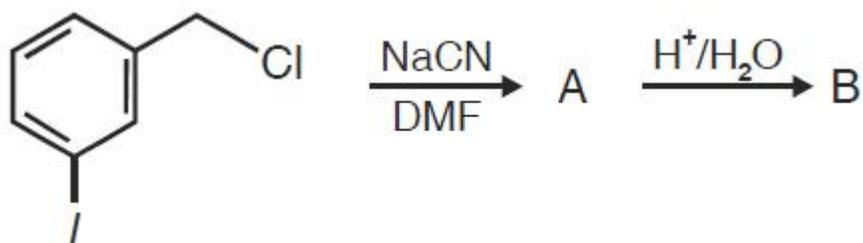**UNIT 10- HALOALKANES AND HALOARENES**

TYPE QUESTIONS (1 MARK)

1. Complete the following reactions :

$$C_6H_5N_2^+Cl^- + KI \longrightarrow$$

2. Arrange the following in the increasing order of property indicated :
   (i) CH_3F, CH_3Cl, CH_3Br, CH_3I (Increasing reactivity towards nucleophilic substitution).

3. Identify the products formed in the following sequence :

4. Give a chemical test to distinguish between the following pairs of compounds :
   (i) Chlorobenzene and cyclohexylchloride.

5. Thionyl chloride is the preferred reagent for converting ethanol to chloroethane. Give reason.

SA(I) TYPE QUESTIONS (2 MARKS)

1.In the following pairs which halogen compound undergoes faster S_N1 reaction?
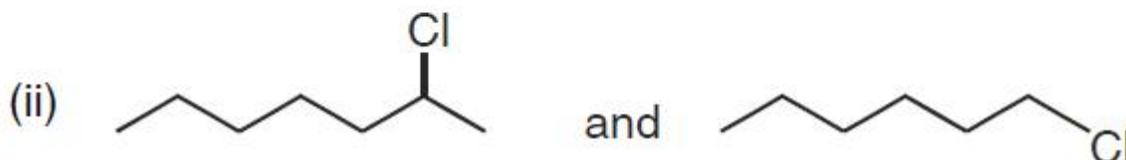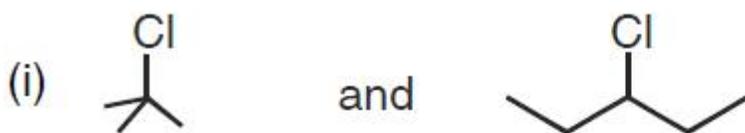
2. Give reasons for the following :

(i) The bond length of C–Cl bond is larger in haloalkanes than that in haloarenes.

(ii) Haloalkanes react with KCN to form alkyl cyanide as main product while with AgCN alkylisocyanide is the main product.

3.When 3-methylbutan-2-ol is treated with HBr, the following reaction takes places :

$$CH_3-CH-CH-CH_3 \xrightarrow{\text{HBr}} CH_3-\underset{\underset{CH_3}{|}}{\overset{\overset{Br}{|}}{C}}-CH_2-CH_3$$

(with CH_3 and OH substituents on the left compound)

SA (II) TYPE QUESTIONS (3 MARKS)

1. An organic compound C $_8$H $_9$Br has three isomers A, B and C. A is optically active. Both A and B gave the white precipitate when warmed with alcoholic $AgNO_3$ solution in alkaline medium. Benzoic
acid, Terephthalic and *p*-Bromobenzoic acid were obtained on oxidation of A, B and C respectively. Identify A, B and C.

2. An organic compound (A) having molecular formula C $_3$H $_7$Cl on reaction with alcoholic solution of KCN gives compound B. The compound B on hydrolysis with dilute HCl gives compound C and C on reduction with H_2/Ni gives 1-aminobutane. Identify A, B and C.
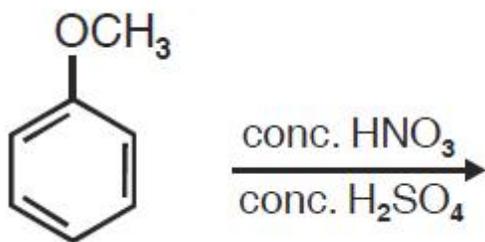
UNIT 11- ALCOHOLS, PHENOLS AND ETHERS
VSA TYPE QUESTIONS (1 MARK)

1. Write IUPAC name of the following compound :

$$CH_2-CH=CH-CH_2OH$$

(with a phenyl/benzene ring attached to the CH_2 group)
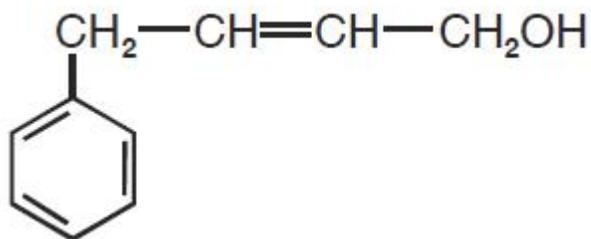
2. Complete the following reaction :

3. What happens when phenol is treated with chloroform in presence of dilute NaOH?

QUESTIONS (2 MARKS)

1. How will you convert:
   (i) toluene to benzyl alcohol
   (ii) 1-Phenylethene to 1-Phenylethanol
2. Give reason for the following :
   (i) Phenol is more reactive towards electrophilic substitution reaction than benzene.
   (ii) The following is not an appropriate method for the preparation of t-butyl ethyl ether :
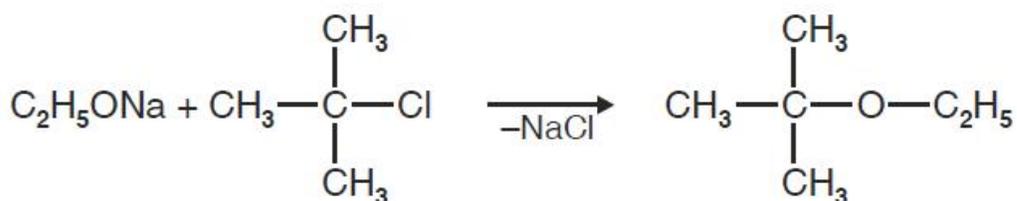
SA (II) TYPE QUESTIONS (3 MARKS)

1. Identify X, Y and Z in the following sequence of reactions :

$$X + conc.\ HNO_3 \longrightarrow Y\ (a\ dinitro\ compound)$$

$$X + Br_2 - Water \longrightarrow Z\ (a\ tribromo\ product)$$
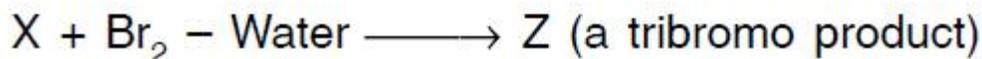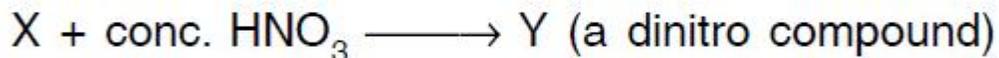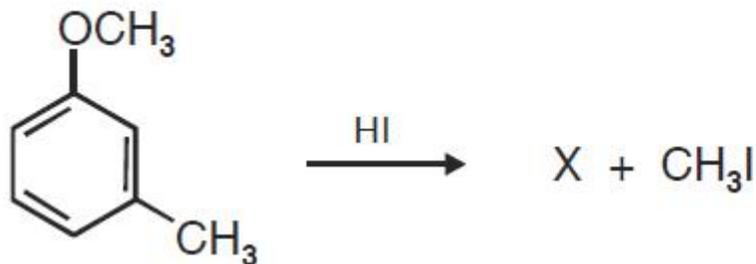
2. Arrange the following in the increasing order of property shown :
(i) Methanol, Ethanol, Diethylether, Ethylene-glycol. (Boiling points)
(ii) Phenol, o-nitrophenol, m-nitrophenol, p-nitrophenol. (Acidic strength)
   (iii)   n-butanol, 2-methylpropan-1-ol, 2-methylpropan-2-ol. (Acidic strength)

LONG ANSWER TYPE QUESTIONS (5 MARKS)

1. An alcohol A ($C_4H_{10}O$) on oxidation with acidified potassium dichromate gives carboxylic acid B ($C_4H_8O_2$). Compound A when dehydrated with conc. H_2SO_4 at 443 K gives compound C. Treatment of C with aqueous H_2SO_4 gives compound D. ($C_4H_{10}O$) which is an isomer of A. Compound D is resistant to oxidation but compound A can be easily oxidised. Identify A, B, C and D and write their structures.

2. An organic compound A having molecular formula C_6H_6O gives a characteristic colour with aqueous $FeCl_3$. When A is treated with NaOH and CO_2 at 400 K under pressure compound B is obtained. Compound B on acidification gives, compound C which reacts with acetyl chloride to form D, which is a popular pain killer. Deduce the structure of A, B, C and D. What is the popular name of Drug D?

UNIT 12- ALDEHYDES, KETONES AND CARBOXYLIC ACIDS
## VSA TYPE QUESTIONS (1 MARK)

1. Indicate the electrophilic acid nucleophilic centre in acetaldehyde.
2. Complete the following reaction :

$CH_3-C(=O)$ (attached to p-chlorophenyl ring) $+ LiAlH_4 \longrightarrow$
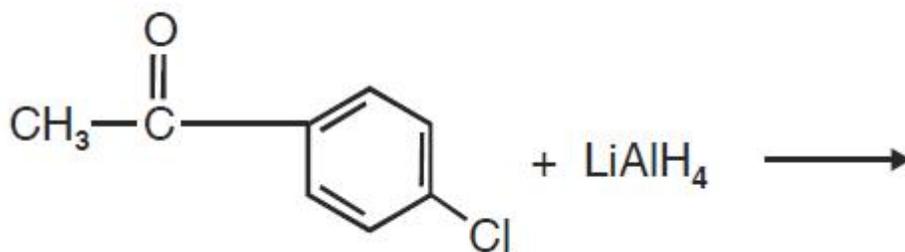
3. Arrange the following in the increasing order of the property indicated:
   CH_3CHO, $HCHO$, CH_3COCH_3, C_6H_5CHO (Reactivity towards HCN)

4. The reactivity of aromatic aldehydes and ketones is less than that of aliphatic carbonyl compounds towards nucleophilic addition reactions. Give reason.

SA(I) TYPE QUESTIONS (2 MARKS)

1. During reaction of carbonyl compound with 2, 4-DNP reagent the pH of the reaction mixture has to be maintained between 3 and 4. Why?
2. During the reaction of a carbonyl compound with a weak nucleophile H^+ ions are added as catalyst. Why?
3. Arrange the following acids in the increasing order of acidic strength
   (i)   Formic acid, benzoic acid, acetic acid

   (ii)
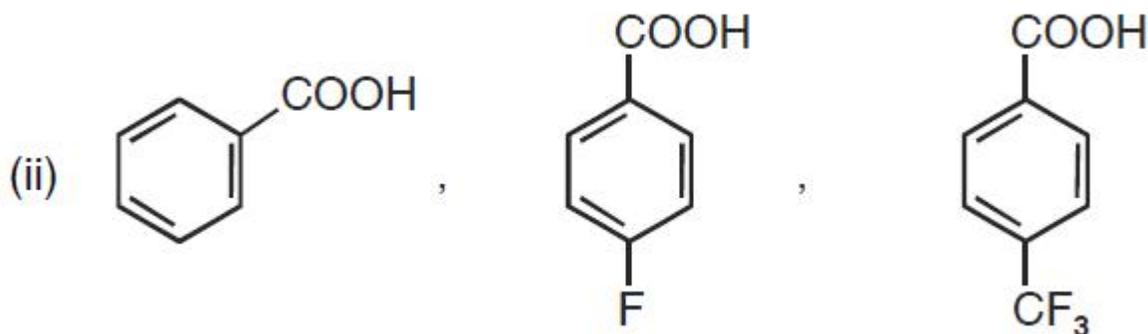
4. You are given four different reagents Zn–Hg/HCl, $NH_2 – NH_2/OH–$ in Glycol, H_2/Ni and $NaBH_4$. Select one reagent for the following transformation and give reasons to justify your answer.
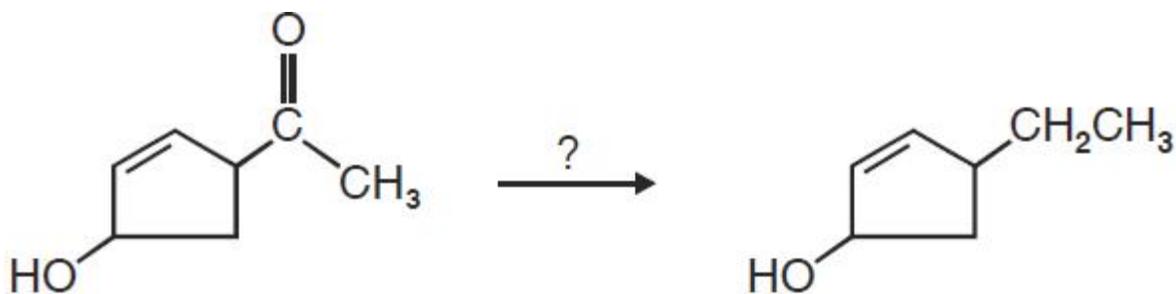
5. Give the chemical tests to distinguish between following pair of compounds :
   (i) Benzaldehyde and acetaldehyde
   (ii) Formic acid and acetic acid

SA (II) TYPE QUESTIONS (3 MARKS)

1. Give reason for the following :
   (i)   p-Nitrobenzaldehyde is more reactive than benzaldehyde towards nucleophilic addition reactions.
   (ii)   Chloroacetic acid has lower pk_a value than acetic acid.
   (iii) There are two $-NH_2$ groups in semicarbazide. However, only one $-NH_2$ group is involved in the formation of semicarbazones.

2. Give the reaction mechanism for following reactions :

   (i) $CH_3CHO + HCN \longrightarrow CH_3-CH \overset{OH}{\underset{CN}{<}}$
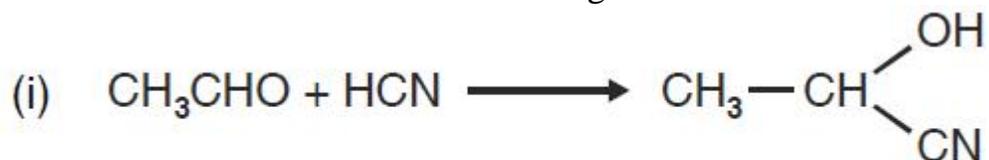
   (ii)
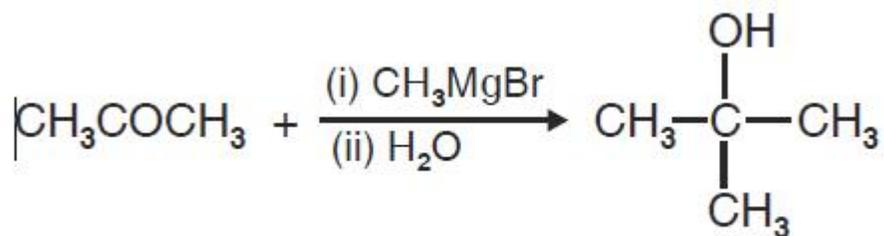
3. How will you prepare the following derivatives of acetone?
    (i) 2, 4-DNP derivative
    (ii) Schiff's base
    (iii) Oxime

4. Complete the following reactions :

$$CH_2=CH-CH_2-CN \xrightarrow[\text{(ii) } H_2O]{\text{(i) AlH } (i\text{-Bu})_2}$$

$$\xrightarrow[\text{(ii) } Zn/H_2O]{\text{(i) } O_3}$$

$$+ CrO_3 + (CH_3CO)_2\,O \longrightarrow$$
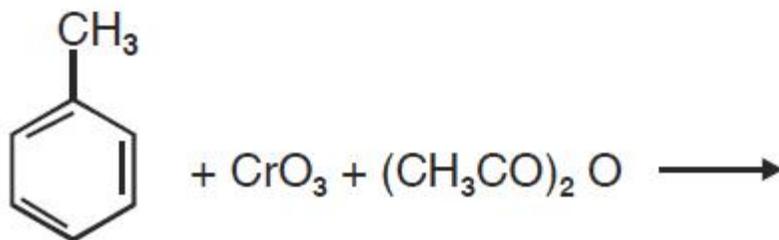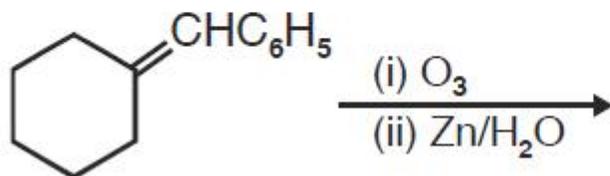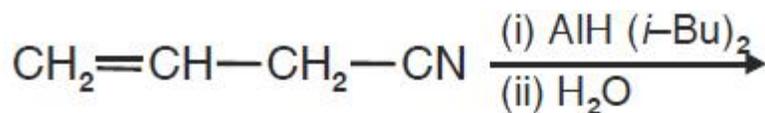
5. Identify the missing reagent/products in the following reactions :

(i) $CH_3CH_2\overset{\overset{\displaystyle O}{\|}}{C}-CH_3 + A \longrightarrow CH_3CH_2COONa + B + NaI + H_2O$

(ii) $+ A \xrightarrow[\text{(ii) } \Delta]{\text{(i) B}}$

(iii) $+ A \xrightarrow[\text{(ii) } \Delta]{\text{(i) dil NaOH}}$
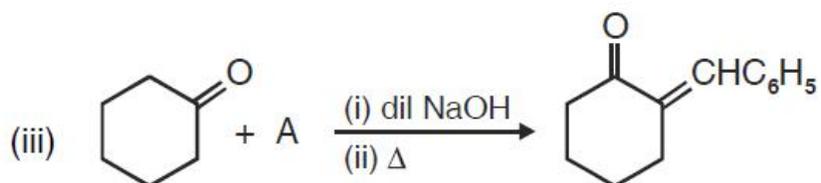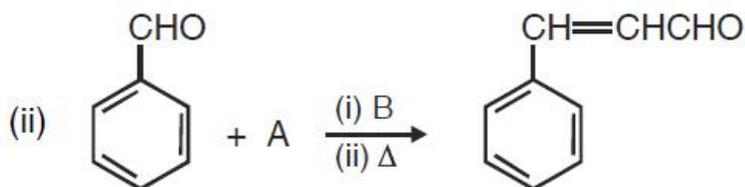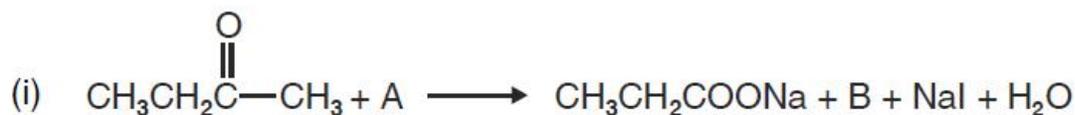
LONG ANSWER TYPE QUESTIONS (5 MARKS)

1. Formaldehyde and acetaldehyde on treatment with dil. NaOH form A which on heating changes to B. When B is treated with HCN, it forms C. Reduction of C with DIBAL- H yields D which on hydrolysis yields E.

2. Identify A, B, C, D and E in the following sequence of reactions :

$$CH_3CH_3 \xrightarrow{\text{Cl}_2/hv} A \xrightarrow{\text{Alc.KOH}} B \xrightarrow{\text{(i) Cl}_2 \text{ (ii) NaNH}_2} C$$

$$E \xleftarrow{\text{aq. KOH}} D \xleftarrow{\text{2 mol HCl}} C$$
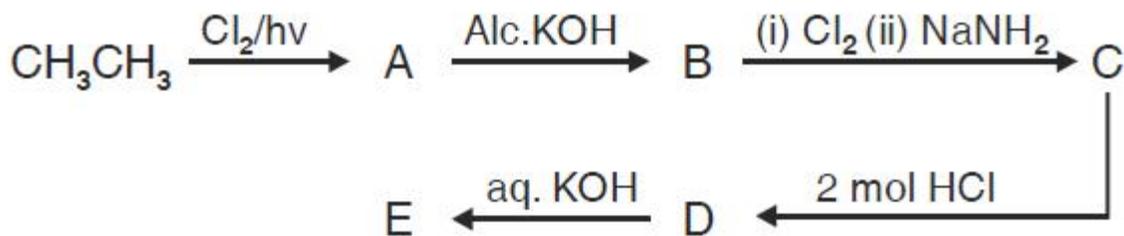
3. An aromatic compound X with molecular formula C $_9$H$_{10}$ gives the following chemical tests :

      (i) Forms 2, 4-DNP derivative

      (ii) Reduced Tollen's reagent

      (iii) Undergoes Cannizzaro reaction

      (iv) On vigorous oxidation gives 1, 2-benzenedicarboxylic acid.

      Identify X and write its IUPAC name. Also write the reactions involved in the formation of above mentioned products.

BIOLOGY

Kindly note: Do the given holiday homework in assignment notebook.

A) Attempt the following questions:

1 mark each:

1. Why do intermodal segments of sugarcane fail to propagate vegetatively even when they are in contact with damp soil?
2. The number of chromosomes in the shoot tip cells of a maize plant is 20. What will be the number of chromosomes in microspore mother cells of the same plant?
3. Name the component cells of the egg apparatus in an embro sac.
4. What is polyembryony? Give two examples
5. Mention the fate of inner cell mass?
6. Why are cucurbits referred to as monoecious?
7. Name a plant which is propagated through floral buds.
8. How many chromosomes do drones of honey bee possess ? Name the type of cell division involved in the production of sperms by them.
9. What is "terror of Bengal"?
10. Where are the pollen grains formed in a plant?
11. How many autosomes are found in the human sperm?
12. Define amphimixis.

13. Why is oxytocin called "birth hormone"?
14. Mention the unique flowering phenomenon exhibited by Strobilanthus kunthiana.
15. How does penicillium reproduce asexually?
16. Name an organism where cell division is itself a mode of reproduction.
17. Why is banana considered a parthenocarpic fruit?
18. A bilobed dithecous anther has 100 microspore mother cells per microsporangium. How many male gametophytes can this anther produce?
19. What is filiform apparatus? What is its function?
20. The meiocyte of rice has 24 chromosomes. How many chromosomes are present in its endosperm?
21. What is the function and location of sertoli cells?
22. What is the significance of epididymis in male fertility?
23. Where do the signals for parturition originate from in humans?

2 mark each:

1. Give two examples of each-
   a)wind pollinated plants   b)water pollinated plants c)insect pollinated plant d)bird pollinated plant
2. Mention the function of each of the following-
   a) tassels of corn cob   b) tapetum in the microsporangium
3. Why do moss plants produce very large number of male gametes ? What are these gamete called ?
4. Why is tender coconut considered a healthy source of nutrition?
5. Draw a well labelled diagram of anatropous ovule.
6. Discuss various functions of human placenta.
7. Cleistogamy can favour only autogamy. Justify.
8. How do leydig cells help in spermatogenesis?
9. Why do the pollen grains of vallisneria have mucilaginous covering to protect themselves?
10. How do copper and hormone-releasing IUD's act as contraceptive?
11. Why is saheli a well accepted contraceptive pill?
12. What is the function of middle piece and leutenising hormone in human males?
13. Write the function of oxytocin and fimbriae in human females.

3 marks each:

1. Explain any three advantages the seeds offer to angiosperms?
2. Why do meiosis and mitosis occur in germ cells?
3. What is apomixes . Comment on its significance. How it can be commercially used ?
4. Draw a well labelled diagram of human sperm.
5. What is aminocentesis? What is its advantage?

6. (a) In which part of the human female reproductive system do the following events take place?

I-Release of Ist polar body   II- Release of 2nd polar body

III-Fertilization   IV- Implantation

(b) From where do signals for parturition originate and what does maternal pituitary release for stimulating uterine contractions for child birth.

7 How do snails seeds , bears , zooplanktons ,fungi & bacteria adapt to conditions unfavorable For their survival ?

8 If one can induce parthenocarpy through the application of growth substances , which fruits would you select to induce parthenocarpy . Why ?

9. In a garden pea, a plant with red flowers was crossed with a plant with white flowers. Work out the possible genotypes and phenotypes of F1 and F2 generations. State any one of Mendel's law that could be derived from this cross?

10 All reproductive tract infections are STDs but all STDs are not RTIs. Justify with example.

5 marks each:

1. Give reasons why-
   a) Most zygotes in angiosperms divide only after certain amount of endospermis formed.
   b) Ground seeds are exalbuminous and castor seeds are albuminous
   c) Micropyle remains as a small pore in the seed coat of a seed.
   d) Integuments of an ovule harden and the water content is highly reduced, as the seed matures.
   e) Apple and cashew are not called true fruits.

2. (a) Draw a longitudinal section of a pistil of an angiosperm showing the growth of the pollen tube up to the micropyle of the ovule. Label (i) stigma, (ii) embryo sac (iii) pollen tube(iv) micropyle.

   (b) Explain the events that occur, up to fertilization, when the compatible pollen grain lands on the stigma.

3. How does oogenesis take place? Describe the process with diagram.

4. Describe the roles of pituitary and various hormones during the menstrual cycle is in a Human female.

5. Your school has been selected by the department of education to organize and host an interschool Seminar on "Reproductive Health – problems and practices " . However many parents are reluctant To permit their wards to attend it . Their argument is that the topic is " too embarrassing "{. Put forth four arguments with appropriate reasons & explanation to justify the topic to be very Essential & timely .

6. A farmer keeps maize grains for raising the next crop . He calls them seeds , but the teacher says morphologically they should not be called seeds but grains.

   (i) Explain what the farmer means by seeds.

   (ii) What does the teacher say they are not seeds, but grains? Explain along with a labeled Diagram of the vertical section of maize grain.

7. Draw a diagrammatic sectional view of the female reproductive system of human and label the parts-
   a) Where the secondary oocytes develop
   b) Which helps in collection of ovum after ovulation

c) Where fertilization occurs

d) Where implantation of embryo occurs

e) Birth canal

II Do as Directed

Differentiate between:

A) Xenogamy and Geitonogamy

B) Oviparous and Viviparous organisms

C) Parthenogenesis and Parthenocarpy

D) Zoospore and Zygote

E) Gametogenesis and Embryogenesis

F) Microsporogenesis and Megasporogenesis

G) Hypocotyl and Epicotyl

H) Perisperm and Pericarp

I) Coleoptile and Coleorhiza

J) Integument and Testa

K) Dicot and Monocot Embryo

L) Codominance and Incomplete Dominance

M) Menstrual and Oestrous Cycle

III Project work:

Prepare a project file on any topic related to the syllabus. The project should be based on any one of the following:

- Case Study
- Field Survey
- Experimentation

INFORMATICS PRACTICES

Q.1 Answer the following Questions:

1. What is JVM and bytecode?
2. Which property of ListBox is used to enter the list of items while working in NetBeans?
3. What is the purpose of break statement in a loop?
4. What is the similarity and difference between option buttons and check boxes?
5. Find the output:
   ```
   int   a=5, b=25;
   while(a>=b)
   {
   a=a+10;
   ```

```
b=b-10;
}
```

6. What will be values of *a* and *b* after execution of the following code:

```
int a=1, b=0;
    for(a=2;a<=4;++a)
{
            b=a++;
            --b;
}
```

7. Rewrite the following program code using a **FOR** loop:

```
int i=1, s=0;
while(i<10)
{
        s+=i;
        i+=2;
}
```

8. Regal Theater has computerized its ticketing system. The programmer has developed a GUI application in Netbeans as shown below:

At ticket counter, three types of tickets(Box, balcony and General) at the rate of 200, 150 and 100 respectively are available. If the movie is tax free, then the total amount should be deducted by Rs. 25 per ticket.

a) What should be done so that only one of the radio button (Box, Balcony and general) can be selected at a time.

b) Write code to do the followings :
   - Calculate and display the Total amount in the corresponding text field when calculate button is pressed.

- Clear all the text fields.
- Close the application when Exit button is clicked.

Note: (You can assume any suitable names for various controls on the form)

9. What is the difference between executeQuery() and executeUpdate() methods?
10. Which method would you use to obtain following type of data from a result set?

    a) int data   b) string data

11. Write the java statement to load the drivers?

Q2. Answer the following Questions:

1. Give one difference and one similarity between PRIMARY KEY and UNIQUE key.
2. Differentiate between :
   a) char and varchar datatypes.
   b) Single row and multi row function (with examples)
3. What is Sql? Also explain in brief all Sql statements with example.
4. Name a function of MySql used to give the first occurrence of a string2 in string1.
5. What is the difference between "%" and "-" wild card characters with reference to LIKE clause of MySql?
6. Write MYSQL commands for the following:

Table: LIBRARY

No	Title	Author	Subject	Publisher	Quantity	Price
1	Data Structure	Lipschute	DS	McGraw	4	217.00
2	DOS Guide	NORTRON	OS	PHI	3	175.00
3	Turbo C++	Robort Lafore	Prog	Galgotia	5	270.00
4	Dbase Dummies	Palmer	DBMS	PustakM	7	130.00
5	Mastering Windows	Cowart	OS	BPB	1	225.00
6	Computer Studies	French	FND	Galgotia	2	75.00
7	COBOL	Stern	Prog	John W	4	1000.00
8	Guide Network	Freed	NET	Zpress	3	200.00
9	Basic for Beginners	Norton	Prog	BPB	3	40.00
10	Advanced Pascal	Schildt	Prog	McGraw	4	350.00

a) Write MYSQL command to create LIBRARY table with the fields given in the Library table.

    (set No field as primary key and Title field should not be NULL)
a) To display the title of all books with Price between 100 and 300.
b) To display Title and Author of all the books having type Prog and published by BPB.
c) To display list of all the books with price more than 200 in ascending order.
d) To display the structure of the Library table.
e) Delete all the books whose quantity is less than 3.
f) Display all the books whose name starts with c
g) Increase the price of all the books by 10%

7. A table "EMP" has one of its column named salary. Give the command in MySql to decrease the salary of all the employees by Rs. 200.
8. Write the output of the following code:
   a) SELECT ROUND(6.5675,2);
   b) SELECT DAYOFMONTH("2009-08-25");
   c) SELECT MID("CLASS 12",2,3);
   d) SELECT CONCAT(LOWER('Class'), UCASE('xii'));
9. Write a command to add a NOT NULL constraint on fees column of a student table.
10. Table BANK has 2 rows and 3 columns. What will be the degree and cardinality of the table.
11. Write MySql command to open an already existing database "CONTACTS".
12. Mr. Kartik wants to remove all the rows from Inventory table to release the storage space, but he does not want to remove the structure of the table. What MySql statement should he use?
13. How would you calculate 13 * 15 in SQL?
14. Is NULL value same as 0? Explain.
15. Identify the error and write the correct command:
    a) Delete all FROM TABLE Emp;
    b) UPDATE TABLE EMP SET COMM=COMM+50;
16. Sarthak, a student of class XII, created a table "Class". Grade is one of the columns of this table. To find the details of students whose Grades have not been entered, he wrote the following MySql query, which did not give the desired result:
    SELECT * FROM Class WHERE Grade="Null";
    Help Sarthak to run the query by removing the errors from the query and write the correct query.
17. While creating a table 'Customer' Smrita forget to set the primary key for the table. Give the statement which she should write now to set the column 'CUSTID' as the primary key of the table?
18. Write a command to print first three characters of "Information".
19. Write the MySql commands for the following:
    a) Add one column Email of data type VARCHAR and size 30 to the table CUSTOMER.

    b) Add a foreign key reference frn_key on DeptID field of the Employee2 table referring DeptID of Department table.
20. Define the following:
    a) Alternate Key
    b) Candidate key
    c) DISTINCT
    d) ALTER command

Project & Record File work for Board Practical

PHYSICAL EDUCATION

UNIT-1 PLANNING IN SPORTS

Q.1 What is knock-out tournament?
Q.2 What is seeding?
Q.3 What is Bye?
Q.4 What is Health Run?
Q.5 Briefly explain about Intramural.
Q.6 Explain briefly any three specific sports programme.
Q.7 Draw a fixture of 21 teams on knock-out basis.

UNIT-2 WOMEN AND SPORTS

Q.1 What do you mean by Female Athlete Triad?
Q.2 Define Anaemia.
Q.3 What is Osteoporosis?
Q.4 Explain briefly any three reasons for less participation of women in sports.
Q.5 Elucidate the sports participation of women in India.

PROJECT WORK:-

(i) AAPHER-Physical Fitness Test (Write any five test)
(ii) Project file on any one game/sport given below:
(Athletics, Basket Ball, Volley Ball, Hand Ball and Hockey etc)

PHYSICS

Magnetic effect of current and magnetism

1 Mark Questions

1. Out of Voltmeter and Millivoltmeter, which has the higher resistance?
2. Out of Ammeter and Milliammeter, which has the higher resistance?
3. An electron moving with Kinetic Energy 25 keV moves perpendicular to a uniform magnetic field of 0.2 mT. Calculate the time period of rotation of electron in the magnetic field.
4. An electron is revolving around the nucleus of an atom in an orbit of radius 0.53 Å. Calculate the equivalent magnetic moment, if the frequency of revolution of the electron is 6.8×10^9 MHz.
5. A proton, alpha particle and deuteron are moving in circular paths with same kinetic energies in the same magnetic fields. Find the ratio of their radii and time periods.

2 Mark Questions

1) A charged particle q is moving in a uniform magnetic field B with a velocity V. Show that the network done on the changed particle by the magnetic field is Zero.

2) A changed particle q enter a magnetic field at right angles to the magnetic field.Obtain an expression for radius of path.

3) A cyclotron uses small electric field, yet accelerates the charged particles to very high velocities. How?

4) Explain the symbols in the equation F = q(V x B) which are the two pairs of vectors always perpendicular to each other.

5) The coil of a galvanometer has a resistance of 100 ohm.It shows a full scale deflection for a current of 5 x 10-4 A How will you convert it into a voltmeter reading a maximum potential difference of 5 volts.

6)A beam of a - particles and of proton of same velocity V enter a uniform magnetic field at right angles to the field lines. The particles describe circular paths. What is the ratio of their radii?

7) Derive an expression for frequency oscillation of electric field in a cyclotron.

8) Show that two infinitely long parallel conductor carrying current in the same direction attract each other.

9) Derive an expression for magnitude of force per unit length between two long parallel conductors carrying current i1 and i2 separated by a distance of d meter.

10) A charged particle of mass 5 mg and charge q = 2 µC has velocity v= 2i – 3j + 4k. Find out the magnetic force on the charged particle and its acceleration at this instant due to the magnetic field B = 3j – 2k. B and v are in Wb/sq. m and m/s respectively.

3 mark questions

1) A rectangular coil of n turns and area of cross section A is placed in a uniform magnetic field B with the area vector making an angle Æ with

B.Derive an expression for torque on the coil.

2) A galvanometer coil of 50 ohm resistance shows full scale deflection for a current of 5 mA. How will you convert this galvanometer into a voltmeter of range 0 – 15 V?

1) A rectangular coil of n turns and area of cross section A is placed in a uniform magnetic field B with the area vector making an angle Æ with B.Derive an expression for torque on the coil.

2) State the principle of a moving coil galvanometer Derive an Expression for the current sensitivity of the moving coil galvanometer.

3) Derive expression for shunt resistance and series resistance needed to convert a galvanometer into an ammeter and a voltmeter respectively.

4) To increase the current sensitivity of the moving coil galvanometer by 50 % its sresistance is increased so that the new resistance becomes twice its initial resistance. By what factor does its voltage sensitivity change ?

6). Two wires of equal length are bent in the form of two loops. One loop is square whereas the other is circular. These are suspended in same magnetic field and same current is passed through them. Explain with reason which will experience greater torque?

7) A circular coil of 30 turns and radius 10cm carrying a current of 5A is suspended vertically in a uniform horizontal magnetic field of 100G. The

field lines make an angle of 60o with the normal to the coil. Find the torque acting on this coil. Would the answer change if instead of the circular coil , we had a square coil but with the same area?

8) An alpha particle and a proton are accelerated by the same potential difference of 50V and enter a magnetic field of 100T perpendicular to their velocity. What kind of path will they trace in the magnetic field. Find the ratio of their radius and time period

9) Find the magnetic field at the center of the Circle of radius 2m, if 5A current is flowing in the Direction shown. The wire is assumed to be very long.

10). A rectangular (10cm x 5cm) and having 1000 turns with a current of 2A is placed in a uniform magnetic field of 100 Gauss directed along the positive x axis. Due to the magnetic field a torque will act on it. Under what conditions will this torque be maximum and when will it be minimum.

11) A particle of mass 50gm has a charge of 2mC. The region consists of a uniform magnetic field of 500G directed into the plane. The particle enters the region with a velocity of 250m/s towards north. Using a figure show the path of the particle and find the following

a. Force acting on the particle

b. Radius of its path

c. Time period of its motion

d. Frequency

12). An infinite wire carries a current of 4A in the South to North direction. Find the magnetic field at a point 5m to the east of this wire.Give the direction of the field.

13). A circular coil of radius 50cm has 10 turns and carries a current of 5mA. A soft iron piece of relative permeability 800 is kept inside it. Find the magnetic induction at its centre.

5 mark question

1) Describe the theory and working of a cyclotron with the help of a labeled diagram. Why an electron can not be accelerated using cyclotron.

2) Find an expression for the force on a moving charge in a magnetic field. State Fleming's left hand rule. Find the force on a moving charge when (i) moving parallel or anti parallel to the field (ii) moving at right angle to the field and (iii) at rest. Also give the definition of unit magnetic field.

3) State and explain Biot-Savart law. Using it derive an expression for the magnetic field at a distance from a straight infinitely long current carrying conductor

4) Derive the equation for magnetic field due to a circular coil carrying current (a)at a point on its axis.(b) at its centre

5)Derive an expression for the force between two straight parallel current carrying conductors of infinite length and hence define one ampere.

CURRENT ELECTRICITY

2 Mark Questions

Q1. Deduce Ohm's law using the concept of drift velocity.

Q2. State Kirchhoff's laws for electric networks.

Q3. Distinguish emf and terminal voltage.

Q4. Derive an expression for drift velocity.

Q5. The drift velocity is of the order of a few cm/s. But when we switch on a bulb, it glows instantly. How is this possible?

3 Mark Questions

Q1. A battery om emf E and internal resistance r gives a current 0.5 A with an external resistance of 12 Ω and a current 0.25 A with an external resistance of 25Ω. Calculate the internal resistance and emf of the cell.

Q2. An electric motor operating on a 50 V dc supply draws a current of 12A. If the efficiency of the motor is 30%, estimate the resistance of the windings of the motor.

Q3. Draw the diagram showing the experimental arrangement for determining the resistance of a given wire of unknown resistance.

Q4. An ammeter of unknown resistance is connected across two identical cells each of emf 1.5V. When the cells are connected in series, the ammeter records a current of 1A and when the cells are in parallel, the current is 0.6A. What is the internal resistance of the cell?

Q5. Distinguish between electric power and electric energy.

Q6. Give any three uses of secondary cells.

Q7. Define: current density. Give its unit.

Q8. State Faraday's laws of electrolysis

Q9. What is superconductivity?

Q10. An iron box of 400 W power is used daily for 30 minutes. If the cost per unit is 75 paise, find the weekly expense on using the iron box.

5 Mark Questions

Q1. Explain how a potentiometer is used to determine the internal resistance of a primary cell.

Q2. State the factors affecting the internal resistance of a cell.

Q3. Define mutual induction and mutual inductance. Derive an expression for the mutual inductance of a pair of solenoids. What are the factors affecting the mutual inductance of a pair of solenoids?

Q4. Derive an expression for the average value of ac for a half cycle.

Q5. Derive an expression for the RMS value of ac.

ELECTROSTATICS

1 Mark Questions

Q1. The dielectric constant of a substance is 5. What is the absolute permittivity of the substance?

Q2. If two identical charged spheres seperated by a string of a equal length are allowed to hang through freely falling elevator , what is the angle between the strings?

Q3. Shown in the figure is a uniform electrostatic field. How will the field lines modify if a mettalic solid sphere is placed at the dotted place?

Q4. Defin Electron Volt.

Q5. Illustrate a condition in which electric field is not zero but potential is zero?

2 Mark Questions

Q1. How can a charge of 10uC be distrubuted between two particles placed 5cm apart so that the repulsive force between them is maximum?

Q2. Two fixed charges +4q and +q are at a distance r. At what point between these charges a third charge q must be placed to keep it in

equilibrium.

Q3. Draw the electric field lines for the following configurations:
• q < 0
• Two like charges separated by distance r
• Two unlike charges(q&-q) separated by distance r

Q4. If E = 6i+3j+4k, calculate the elecric fux through a surface area 20 units in the y-z plane.

Q5. Graphically represent the variation of:
• electric field
• electric potential due to charged conducting sphere with the distance from the centre.

Q6. Draw equipotential surfaces for
• A radially outward electric field
• Uniform electric field
• Electric field pointing along x direction every where with magnitude increasing along the direction

Q7. An uncharged capacitor is connected to a battery. Show that the energy supplied by the battery is lost as heat while charging the capacitor.

Q8. Two capacitors of capicitance 6uF & 12uF are connected in series with a battery. The voltage across the 6uF capacitor is 2V. Compute the total battery voltage.

Q9. Four charges +q,-q,+q and -q are placed in order on the four consecutive corners of a square of side a. Find the work done in interchanging the positions of any two neighbouring charges of opposite sign.

Q10. Charges of magnitude 2Q & -Q are located at points (a,0,0) and (4a,0,0). Find the ratio of the flux of electric field, due to these charges, through concentric spheres of radii 2a and 8a centered at the origin.

3 Mark Questions

Q1. Obtain expression for electric potential due to small dipole at a general point. Hence writ its value at any point on axial line and equatorial plane.

Q2. Obtain expression for energy stored in a parallel plate capacitor. Hence derive expreesion for energy density.

Q3. Find the amount of work done in arranging th three point charges 6uC,6uC and -6uC on the vertices of an eqilateral triangle of side 10cm.

Q4.i) Write any four properties of conductors in electrostatic equilibrium.
ii) Obtain the expression for electric field immediately outside the surface of conductor.

Q5.State the Gauss's law and derive the expression for electric field at a distance r from a uniformly charged hollow metallic sphere of radius R when r < r, r = R & r >R. Plot the variation of E with r (distance from the centre).

Q6.i) An electric dipole is held in uniform electric field. Show that no translatory force acts on it.
ii) Derive an expression for Torque acting on it.

Q7. At a point due to a point charge, values of electric field and potential

are 30 N/C and 15 J/C respectively. Calculate (i) magnitude of the charge (ii) distance of the charge from the point of observation.

Q8.i) How does electric field and electric potential due to a point change vary with distance from the point charge? Draw a graph to show the reelationship.

ii) Mention the contrasting features of electric potential due to a dipole and due to a single point charge.

Q9. Suppose three points are set at equal distance = 90cm from the centreof the dipole, point A is on the dipole axis above the positive charge, B is on the axis below negative charge at point C which is on the perpendicular bisector of the line joining the charges. What would be the electric potential due to the dipole at points A, B and C.

Q10. Two points charges -9q and +9q are placed a distance d apart. A third charge is so placed that all the three charges are in equilibrium. Find the location, magnitude and nature of the third charge.

5 Mark Questions

Q1. Explain the principle of working of a vandegraff generator with the help of a labelled diagram.

Q2. Derive the expression for electric field due to an electric dipole at an equatorial point. Establish mathematically that this electric field intensity is half the value of intensity at the same distance along the axial line.

Q3. Derive an expression for capicitance of parallel plate capacitor with dielectric slab between the plates. How could the (i) energy (ii) charge (iii) potential difference (iv) electric field (v) energy density gets affected if dielectric slab introduced (a) with battery connected (b) after battery is disconnected.

Q4. If a capacitor is disconnected from the battery, what will be the energy stored in the capacitor when

i) Separation between plates is doubled.

ii) Uncharged and identical capacitor is connected across it.

iii) Dielectric slab and thickness (t<d) is inserted in it.

iv) Dielectric slab and thickness (t=d) is inserted in it.

Conducting slab of thickness (t<d) is inserted in it.

Q5. Explain th underlying principle of a parallel plate capacitor. If two similar plates, each of area A having surface charge densities +σ and -σ are separated by distance d in air.

i)Write expression for electric field at points between the two plates and outside the plates.

ii) Potential sifference between the plates.

iii) Derive the capacitance of the capacitors so formed.

PAINTING

Q1. Write down the origin & development of rajasthani school of Painting.

Q2. Appriciate any of the following painting based of its Artist , subschool, subject matter & composition.

(a). Radha Banithani

(b). Maru Ragini

Q3. Describe the main features of pahari school of paintings.

Q4. Which human life value are depicted in the painting?

(a). Bharat worshipping the Charan Paduka of Rama and

(b). Nand and yashoda & Krishna with Kinsmen going to Vrindavan.

Practical:-

Draw and colour

LANDSCAPE   -   5

STILL   LIFE   -   5

COMPOSITION ON DAILY LIFE   -   5

MATHEMATICS

Relation & Function

Q1. Find the inverse of the function f(x) = $\frac{e^x - e^{-x}}{e^x + e^{-x}}$ + 2.

Q2. If R→ R $be\ defined\ by\ f\ x\ =\ \frac{x}{\sqrt{1+x^2}}, then\ find\ fofof\ x$.

Q3 Let A = { 1 ,2 , 3} . Find the number of relation on a containing (1 , 2) & (1 , 3) which are reflexive , symmetric but not transitive

Q4 Show that the exponential function , f : R → R given by , f (x) = e^x , is one – one but not onto .

Q5 Consider the function f : [0 , $\frac{\pi}{2}$] → R , given by g (x) = cos x . show that

(I) f is one – one(II) g is one – one (III) f + g is not one – one

Q6 Show that , f : R → R given by , f (x) = x - x , is neither one – one nor onto , where x denotes greatest integer less than or equal to x .

Q7 Let f : R → R be a function given by f (x) = ax + b , for all $\in$ R . Find the constants ' a' and 'b' such that f o f = I$_R$

Q8 If f : R → (- 1 , 1) defined by f (x) = $\frac{10^x - 10^x}{10^x + 10^x}$ is invertible , find f^{-1}

Q9 Determine whether the functions * defined below are binary operation or not . If yes, determine whether they are commutative &associative . find all the invertible elements elements& their inverse is * on P (x) is defined by A *B = A ∩ B , where P (x) denotes the power set of a non - empty set X

Q10 Find the number of binary operation on { 1 , 2 } having 1 as the identity element .

Inverse trigonometric function

Q1. Prove that :$\tan\left(\frac{\pi}{4} + \frac{1}{2}\cos^{-1}\frac{a}{b}\right) + \tan\left(\frac{\pi}{4} - \frac{1}{2}\cos^{-1}\frac{a}{b}\right) = \frac{2b}{a}$

Q2. Prove that : $2\tan^{-1}\left(\sqrt{\frac{a-b}{a+b}}\tan\frac{\theta}{2}\right) = \cos^{-1}\frac{a\cos\theta+b}{a+b\cos\theta}$

Q3 Solve :$\sin^{-1}\frac{15}{x} + \sin^{-1}\frac{8}{x} = \frac{\pi}{2}$

Q4 Solve :$\sin^{-1}(6\sqrt{3} x) + \sin^{-1}(6 x) = \frac{\pi}{2}$

Q5 Solve :$\cos (\tan^{-1}x) = \sin\left(\cot^{-1}\frac{3}{4}\right)$

Q6 Solve : $\sin [2\cos^{-1}\cot 2\tan^{-1}x] = 0$

Q7 If $y = \cot^{-1}\sqrt{\cos x} - \tan^{-1}\sqrt{\cos x}$, then prove that $\sin y = \tan^2\frac{x}{2}$

Q8 If $\cos^{-1}\frac{x}{2} + \cos^{-1}\frac{y}{3} = \alpha$, then prove that

$9x^2$ - 12xy cos α + 4 y^2 = 36 $sin^2 \alpha$

Q9 If $\cos^{-1}x + \cos^{-1}y + \cos^{-1}z = \pi$ then prove that $x^2 + y^2 + z^2 + 2$ xyz = 1

Q10 If x , y , z $\in$ [-1 , 1] such that $\sin^{-1}x + \sin^{-1}y + \sin^{-1}z = \frac{3\pi}{2}$, then

prove that $x^{2006} + y^{2007} + z^{2008} - \frac{9}{x^{2006} + y^{2007} + z^{2008}} = 0$

Matrix

Q1. If A = $\begin{bmatrix} \frac{-1+\sqrt{3}i}{2i} & \frac{-1-\sqrt{3}i}{2i} \\ \frac{1+\sqrt{3}i}{2i} & \frac{1-\sqrt{3}i}{2i} \end{bmatrix}$ and $f x = x^2 + 2$, t?en find f A .

Q2. If A = $\begin{bmatrix} -1 & 3/2 \\ -1/2 & 1/2 \end{bmatrix}$, t?en find t?e value of $I + A + A^2 + A^3 + \cdots \infty$.

Q3 If A = $\begin{bmatrix} 0 & -\tan\frac{\theta}{2} \\ \tan\frac{\theta}{2} & 0 \end{bmatrix}$, then show that $I + A = (I - A)\begin{bmatrix} \cos\theta & -\sin\theta \\ \sin\theta & \cos\theta \end{bmatrix}$

Q4 Prove that the product of $\begin{bmatrix} \cos^2\theta & \cos\theta\sin\theta \\ \cos\theta\sin\theta & \sin^2\theta \end{bmatrix}$ and $\begin{bmatrix} \cos^2 & \cos\sin \\ \cos\sin & \sin^2 \end{bmatrix}$ is null matrix , when θ& differ by an odd multiple of $\frac{\pi}{2}$

Q5 If A = $\begin{bmatrix} \cos\alpha & -\sin\alpha \\ \sin\alpha & \cos\alpha \end{bmatrix}$, then find value(s) of α such that $A^T + A = I_2$

Q6 If A = $\begin{matrix} 0 & 2b & c \\ a & b & -c \\ a & -b & c \end{matrix}$, then find the values of a , b , c & d such that $A^T A = I$

Q7 Show that all the diagonal elements of a skew symmetric matrix are zero

Q8 Show that every square matrix can be uniquely expressed as the sum of a symmetric & a skew symmetric matrix

Q9 Show that a matrix which is both symmetric & skew symmetric is a null matrix

Q10 If A & B commute , then prove that $AB^n = B^n A$, for all n N .

Determinant

Q1. Without expanding at any stage show that

$$\begin{vmatrix} x^2 + x & x + 1 & x - 2 \\ 2x^2 + 3x - 1 & 3x & 3x - 3 \\ x^2 + 2x + 3 & 2x - 1 & 2x - 1 \end{vmatrix} = xA + B, w\square ere\ A\ and\ b\ are\ constants.$$

Q2. If $\begin{matrix} a & p,b & q,c & r \end{matrix}$ and $\begin{vmatrix} p & b & c \\ a & q & c \\ a & b & r \end{vmatrix} = 0, t\square en\ find\ t\square e\ value\ of\ \frac{p}{p-a} + \frac{q}{q-b} + \frac{r}{r-c}.$

Q3 If A is a square matrix such that $A^T A = I$, write the value of $|A|$

Q4 If A is a matrix of order 3 X 3 such that A(adj A) = $\begin{matrix} 5 & 0 & 0 \\ 0 & 5 & 0 \\ 0 & 0 & 5 \end{matrix}$, then find $|adj\ A|$

Q5 Solve the matrix equation A $\begin{matrix} 1 & -2 \\ 1 & 4 \end{matrix} = \begin{matrix} 1 & 2 \\ -1 & 3 \end{matrix}$

(1)   By using concept of inverse
(2)   Without using concept of inverse

Q6 Solve the matrix equation $\begin{matrix} 3 & 2 \\ 7 & 5 \end{matrix}$ A $\begin{matrix} -1 & 1 \\ -2 & 1 \end{matrix} = \begin{matrix} 2 & -1 \\ 0 & 4 \end{matrix}$

Q7 Using properties of determinants , evaluate $\begin{vmatrix} a^x + a^{-x\ 2} & a^x + a^{-x\ 2} & 1 \\ a^y + a^{-y\ 2} & a^y + a^{-y\ 2} & 1 \\ a^z + a^{-z\ 2} & a^z + a^{-z\ 2} & 1 \end{vmatrix}$,where a > 0 & x,

y R

Q8 Without expanding , prove that $\begin{vmatrix} b^2c^2 & bc & b + c \\ c^2a^2 & ca & c + a \\ a^2b^2 & ab & a + b \end{vmatrix} = 0$

Q9 Using properties of determinants , evaluate
$$\begin{vmatrix} 9! & 10! & 11! \\ 10! & 11! & 12! \\ 11! & 12! & 13! \end{vmatrix}$$

Q10 If a, b , c are p^{th}, q^{th} & r^{th} terms respectively of a G.P , prove that

$$\begin{vmatrix} \log a & p & 1 \\ \log b & q & 1 \\ \log c & r & 1 \end{vmatrix} = 0$$

Q11 Prove that

$$\begin{vmatrix} -bc & b^2+bc & c^2+bc \\ a^2+ac & -ac & c^2+ac \\ a^2+ab & b^2+ab & -ab \end{vmatrix} = ab+bc+ca\ ^2$$

Continuity & differentiabiity

Q1. If $y = x\ \overline{\sqrt{a^2-x^2}} + a^2 \sin^{-1}\frac{x}{a}$, then prove that $\frac{dy}{dx} = 2\ \overline{\sqrt{a^2-x^2}}$.

Q2. If $\cos^{-1}\frac{x^2-y^2}{x^2+y^2} = \tan^{-1}a$, prove that $\frac{dy}{dx} = \frac{y}{x}$.

Q3 Does there exist a function which is continuous but not differentiable at x = 2 & x = 3 ? justify your answer

Q4 Differentiate $\log_9 x + \log_x 9 + \log_x x + \log_9 9$

Q5 If tan (x + y) + tan (x − y) = $\frac{\pi}{4}$, then find $\frac{dy}{dx}$

Q6 Differentiate $x^{x\ x}$ w.r.t x

Q7 If $x = e^\theta\ \left(\theta + \frac{1}{\theta}\right)$; $y = e^{-\theta}\ \left(\theta - \frac{1}{\theta}\right)$, then find $\frac{dy}{dx}$

Q8 Differentiate the following w.r.t x :$\tan^{-1}\frac{\overline{x}\ 3-x}{1-3x}$

Q9 Differentiate the following w.r.t x :

$\sin^{-1} X - x^2\ \overline{\sqrt{1-x^2}}$)

Q10 Differentiate y = f (x^3) & f′ (x) = e^{8x} , then find $\frac{dy}{dx}$

Q11 If f (x) = $\begin{vmatrix} x+a^2 & ab & ac \\ ab & x+b^2 & bc \\ ac & bc & x+c^2 \end{vmatrix}$, prove that f`(x) = $3x^2 + 2x\ (a^2+b^2+c^2)$

Q12 If $x^2 + y^2 = a - \frac{1}{a}$ & $x^4 + y^4 = a^2 + \frac{1}{a^2}$, then prove that $\frac{dy}{dx} = \frac{1}{x^3 y}$

Q13 Given that ,$\cos\frac{x}{2}\ \cos\frac{x}{4}\ \cos\frac{x}{8}$ .....= $\frac{sinx}{x}$, then prove that $\frac{1}{2^2}\sec^2\frac{x}{2} + \frac{1}{2^4}\sec^2\frac{x}{4} + ...= cosec^2 x - \frac{1}{x^2}$

Q14 If $\overline{\sqrt{1-x^6}} + \overline{\sqrt{1-y^6}} = \alpha\ (x^3 - y^3)$, then prove that $\frac{dy}{dx} = \frac{x^2}{y^2}\frac{1-y^6}{1-x^6}$

Q15 If $y = 1 + \frac{x}{1!} + \frac{x^2}{2!} + \frac{x^3}{3!} + ...+ \frac{x^n}{n!}$, then prove that $\frac{dy}{dx} - y + \frac{x^n}{n!} = 0$