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II Semester B.Sc. (NEP) Degree Examination, October - 2023

PHYSICS

Electricity and Magnetism

Paper :DSC.

(Repeater)

Time : 2 Hours

Maximum Marks : 60

- Instructions to Candidates:*
- 1) Calculatory are allowed to solve the Problems.
 - 2) Write necessary intermediate steps.

1. Answer any Six questions. (6 × 2 = 12)
 - a) What are scalars and vectors?
 - b) Define divergence of a vector.
 - c) State kirchhoff's voltage and current laws.
 - d) State Biot-savart law.
 - e) What is j-operator?
 - f) Write an expression for resonant frequency of LCR parallel AC Circuit.
 - g) What is Self inductance?
 - h) What are polar molecules?
2. Answer the question a and b or c and d .
 - a) Derive Maxwell's equation in differential form. (8)
 - b) State and explain Gauss divergence theorem. (4)

(OR)

 - c) State and prove poynting theorem. (8)
 - d) State and explain stoke's theorem. (4)
3. Answer the question a and b or c and d .
 - a) State and prove Thevenin's theorem. (8)
 - b) A generator develops 200 VoH and has internal resistance of 100 ohm. Find the power delivered to the load of 100 ohm. (4)





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(OR)

- c) Give the theory of charging and discharging of a capacitor in RC circuit. (8)
- d) Calculate the value of time constant in LR circuit when the current rises to 63.2% of its steady value in 1 second. (4)

4. Answer the question a and b or c and d .

- a) Derive an expression for magnetic field at a point due to straight conductor carrying current. (8)
- b) A Helmholtz galvanometer contains 50 turns and mean radius of 0.2m when a current of 0.1A is passed through the coil, a deflection of 45° is obtained. Calculate the horizontal component of Earth's field. (4)

(OR)

- c) Obtain the expression for impedance and resonant frequency of LCR series circuit. (8)
- d) A resistance of 10 ohm and inductance of 0.1 henry are connected in parallel with capacitance of 1 micro farad Calculate the frequency at which the current is minimum. (4)

5. Answer the question a and b or c and d .

- a) Describe an experiment to determine the self - inductance of a coil by rayleigh's method. (8)
- b) The current sensitivity of a ballistic galvanometer is 4.4×10^{-9} A for a deflection of 1 mm on a scale kept at a distance of 1m. calculate the charge sensitivity of a galvanometer if the periodic time of the coil is 3.14 second. (4)

(OR)

- c) Derive an equation relating D,E and P in dielectrics. (8)
- d) Sketch the block diagram of C.R.O. (4)



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II Semester B.Sc. (NEP) Degree Examination, October - 2023

PHYSICS

Electricity and Magnetism

(Regular)

Time : 2 Hours

Maximum Marks : 60

- Instructions to Candidates:**
- 1) Calculator is allowed to solve the Problems.
 - 2) Write intermediate steps.

1. Answer any Six questions. (6 × 2 = 12)

- a) State coulomb's law of electrostatics.
- b) Write expression for electrostatic energy of a charged sphere.
- c) What are polar and nonpolar molecules?
- d) State Biot-Savart's law?
- e) Define Coercivity (in Hysteresis).
- f) What is displacement current?
- g) State Kirchhoff's laws of electrical circuits.
- h) What is earth inductor?

2. Answer the question a and b or c and d.

- a) Obtain an expression for torque acting on an electrical dipole placed in Electric field. (8)
- b) Determine the magnitude and direction of the electric field at a point 0.03m to the left of point charge of -5.2 n c. (4)

(OR)

- c) Obtain an expression for electrostatic energy of a system of charges. (8)
- d) The plates of a parallel plate air capacitor are separated by a distance of 10^{-3} m. what must be the plate area if the capacitance of the capacitor is to be 0.5F? Given the permittivity of free space = $8.854 \times 10^{-12} \text{ FM}^{-1}$ (4)

P.T.O.



3. Answer the question a and b or c and d .

- a) Derive Relation between D.E and P. Where symbols have their usual meaning. (8)
- b) A parallel plate capacitor has square plates of side 0.05m and separated by a distance of 0.001m.
- i) Calculate the capacitance of this capacitor.
- ii) If a dielectric of dielectric constant 6 is placed between plates of capacitor, what is new capacitance? (4)

(OR)

- c) Derive an expression for magnetic field at a point along the axis of the Circular coil carrying current. (8)
- d) A current of 10-A flows through a straight wire. calculate the magnitude of magnetic field at a point 0.02m away from the wire. [permeability of vaccum is $4\pi \times 10^{-7} H/m$] (4)

4. Answer the question a and b or c and d .

- a) Derive an expression for magnetic intensity at a point due to dipole. [magnet]. (8)
- b) Define Magnetic intensity (H), magnetic induction (B), Magnetization Vector (M) write Relation between B, H, M. (4)

(OR)

- c) Derive an expression for Energy stored in a Magnetic Field. (8)
- d) The magnetic flux associated with a coil changes from zero to 6×10^{-2} Wb in 0.6s. Find the e.M.F. induced in the coil. (4)

5. Answer the question a and b or c and d .

- a) Give the theory of growth and decay of current in RL Circuit. (8)
- b) What is the characteristic time constant for a 7.50 mH inductor in Series with a 3Ω resistor? (4)

(OR)

- c) What is Ballistic Galvanometer. Derive expression for current and time period of Ballistic galvanometer. (8)
- d) What will be the angle of dip if the magnetic field of earth at a certain place has a horizontal component of earth's magnetic field as 0.3×10^{-4} Tesla and the total magnetic field strength is 0.5×10^{-4} Tesla. (4)

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II Semester B.Sc. Degree Examination, October - 2023

ENVIRONMENTAL-STUDIES - AECC

(Regular/Repeater)

Time : 1½ (90 Minutes)

Maximum Marks : 30

Instructions to Candidates:

1. Check for complete printing of 30 questions.
2. The last page of the question paper may be used for rough work.
3. Each question has four multiple choice answer and choose the correct one.
4. Darken the appropriate circle with the ball pen.
5. Damaging/overwriting using whitener on the OMR sheets are strictly prohibited.
6. No candidates will be allowed to leave the examination Hall till the end of the session and without handing over his/her answer sheet to the invigilator.
7. Candidates should ensure that the invigilator has verified all the entries and that the invigilator has affixed his/her signature in the space provided on the OMR.

[P.T.O.]





1. Which component constitutes the plants, animals and the micro-organisms?

- A) Internal components B) Abiotic components
C) Biotic components D) External components

ಕೆಳಗಿನ ಯಾವುದು ಪ್ರಾಣಿಗಳು, ಗಿಡಮರಗಳು ಹಾಗೂ ಸೂಕ್ಷ್ಮಜೀವಿಗಳನ್ನು ಹೊಂದಿವೆ.

- A) ಇಂಟರ್ನಲ್ ಕಾಂಪೋನಂಟ್ B) ಅಬಯೋಟಿಕ್ ಕಾಂಪೋನಂಟ್
C) ಬಯೋಟಿಕ್ ಕಾಂಪೋನಂಟ್ D) ಎಕ್ಸ್ಟರ್ನಲ್ ಕಾಂಪೋನಂಟ್

2. Air-Pollution causes _____

- A) Respiratory diseases B) Gastro-intestinal disease
C) Blindness D) All the above

ವಾಯು-ಮಾಲಿನ್ಯದಿಂದಾಗುವ ಪರಿಣಾಮಗಳು _____

- A) ಸ್ವಾಶಕೋಶದ ಕಾಯಿಲೆ B) ಜೀರ್ಣಕ್ರಿಯೆ ಕಾಯಿಲೆ
C) ಅಂಧತೆ D) ಮೇಲಿನ ಎಲ್ಲವೂ

3. The word biological or biotic means

- A) Living B) Non-living
C) Organism D) Non-organism

ಜೈವಿಕ ಪದದ ಅರ್ಥ

- A) ಜೀವಿಸುವ B) ಜೀವ ಇಲ್ಲದೇ ಇರುವ
C) ಜೀವಿ D) ಅಜೀವಿ

4. The example for renewable-resources are

- A) Coal B) Oil
C) Iron D) Forest

ನವೀಕರಿಸಬಹುದಾದ ಸಂಪನ್ಮೂಲಗಳಿಗೆ ಉದಾಹರಣೆ ಇದು

- A) ಕಲ್ಲಿದ್ದಲು B) ತೈಲ
C) ಕಬ್ಬಿಣ D) ಕಾಡು

5. Terrestrial ecosystem includes _____

- A) Fresh-water ecosystem B) Marine-ecosystem
C) Grass-land ecosystem D) None of these

ಭೂಮಂಡಲದ ಪರಿಸರ ವ್ಯವಸ್ಥೆಯು _____ ಗಳನ್ನು ಹೊಂದಿರುತ್ತದೆ.

- A) ಸಿಹಿನೀರಿನ ಪರಿಸರವ್ಯವಸ್ಥೆ B) ಉಪ್ಪುನೀರಿನ ಪರಿಸರ ವ್ಯವಸ್ಥೆ
C) ಹುಲ್ಲುಗಾವಲಿನ ಪರಿಸರ ವ್ಯವಸ್ಥೆ D) ಯಾವುದೂ ಅಲ್ಲ

6. The complex Network of interconnected food-chains is called.

- A) Trophic level B) Food web
C) Ecological pyramid D) Ecotone

ಅತಿಯಾದ ಸಂಕೀರ್ಣವಾದ ಆಹಾರ ಸರಪಳಿಗಳನ್ನು ಹೀಗೆನ್ನುತ್ತಾರೆ.

- A) ಟ್ರಾಫಿಕ್ ಲೆವೆಲ್ B) ಫೂಡ್ ವೆಬ್
C) ಇಕೋಲಾಜಿಕಲ್ ಫಿರಾಮಿಡ್ D) ಇಕೋಟೋನ್



7. Succession that begins on a sterile region where conditions of existence are not at first favourable.

- A) Primary B) Secondary
C) Territory D) Climax

ಸಕೇಶನ್ ಎನ್ನುವುದು ಬರಡಾದ ಪ್ರದೇಶದಿಂದ ಪ್ರಾರಂಭವಾದರೆ, ಅದನ್ನು ಮೊದಲು ಅನುಕೂಲವಾಗುವಂತಹ ಸ್ಥಿತಿಯಲ್ಲಿರುವುದಿಲ್ಲ.

- A) ಪ್ರಾಥಮಿಕ B) ದ್ವಿತೀಯ
C) ಭೂಮಂಡಲದ ಪ್ರದೇಶ D) ಕ್ಲಿಮ್ಯಾಕ್ಸ್

8. The term ecology was coined by

- A) A.G Tansley B) Ernst Haeckel
C) Aristotle D) Linnaeus

'ಪರಿಸರ ವಿಜ್ಞಾನ' ಪದವನ್ನು ಕಂಡು ಹಿಡಿದವರು

- A) ಎ.ಜಿ. ಟಾನ್ಸ್ಲೇ B) ಅರ್ನಸ್ಟ್ ಹಾಕೆಲ್
C) ಅರಿಸ್ಟಾಟಲ್ D) ಲಿನ್ನೇಯಸ್

9. The animals which consumes decaying organic matter is called.

- A) Carnivore B) Detrivore
C) Herbivore D) Omnivore

ಕೊಳೆತ ಪದಾರ್ಥವನ್ನು ತಿನ್ನುವ ಜೀವಿಗಳಿಗೆ ಹೀಗೆ ಕರೆಯುತ್ತಾರೆ.

- A) ಕಾರ್ನಿವೋರ್ B) ಡೇಟ್ರಿವೋರ್
C) ಹರ್ಟಿವೋರ್ D) ಓಮ್ನಿವೋರ್

10. Which of the following is responsible for Air pollution.

- A) Burning fossil fuels B) Carbon Dioxide
C) Both A and B D) None of these

ಕೆಳಗಿನ ಯಾವುದು ಗಾಳಿ-ಮಾಲಿನ್ಯಕ್ಕೆ ಕಾರಣವಾಗಿವೆ.

- A) ಪಳೆಯುಳಿಕಾ ಇಂಧನಗಳು B) ಕಾರ್ಬನ್ ಡೈಆಕ್ಸೈಡ್
C) A ಮತ್ತು B D) ಯಾವುದೂ ಅಲ್ಲ

11. The endangered bird is _____

- A) Passenger Pigeon B) Pink headed duck
C) Great Indian Bustrad D) Vulture

ಅಪಾಯದಲ್ಲಿರುವ ಪಕ್ಷಿಯು _____

- A) ಪ್ಯಾಸೆಂಜರ್ ಪಿಜನ್ B) ಪಿಂಕ್ ಹೆಡೆಡ್ ಡಕ್
C) ಗ್ರೇಟ್ ಇಂಡಿಯನ್ ಬಸ್ಟರ್ಡ್ D) ವಲ್ಚರ್

12. A species restricted to a given area is

- A) Endemic species B) Allopatric Species
C) Sympatric species D) Sibling species

ಈ ಕೆಳಗಿನ ಜಾತಿಯ ಜೀವಿಗಳನ್ನು ಒಂದೇ ಪ್ರದೇಶದಲ್ಲಿ ನಿರ್ಬಂಧಿಸಲಾಗಿದೆ

- A) ಎಂಡೆಮಿಕ್ ಸ್ಪೀಸಿಸ್ B) ಅಲೊಪ್ಯಾಟ್ರಿಕ್ ಸ್ಪೀಸಿಸ್
C) ಸಿಂಪ್ಯಾಟ್ರಿಕ್ ಸ್ಪೀಸಿಸ್ D) ಸಿಬ್ಲಿಂಗ್ ಸ್ಪೀಸಿಸ್



13. Ranganathittu in Karnataka is known for .

- A) Lions B) Tigers
C) Elephants D) Birds

ರಂಗನತಿಟ್ಟು, ಕರ್ನಾಟಕದಲ್ಲಿದೆ, ಇದನ್ನು ಯಾವುದಕ್ಕೆ ಹೆಸರು.

- A) ಸಿಂಹ B) ಹುಲಿ
C) ಆನೆ D) ಪಕ್ಷಿಗಳು

14. Zoos are example for

- A) In-situ conservation B) In-vivo conservation
C) Ex-situ-conservation D) Ex-vivo conservation

'ಜೂ'ಗಳು ಯಾವುದಕ್ಕೆ ಉದಾಹರಣೆ

- A) ಇನ್-ಸೀಟು ಕಂಸರ್ವೇಶನ್ B) ಇನ್-ವಿವೋ ಕಂಸರ್ವೇಶನ್
C) ಏಕ್ಸ್-ಸೀಟು ಕಂಸರ್ವೇಶನ್ D) ಏಕ್ಸ್-ವಿವೋ ಕಂಸರ್ವೇಶನ್

15. The number of bio-geographical region in India are _____

- A) 3 B) 4
C) 7 D) 10

ಜೀವಿ-ಭೌಗೋಳಿಕ ಪ್ರದೇಶದಲ್ಲಿ ಎಷ್ಟು ಭಾರತದಲ್ಲವೆ.

- A) 3 B) 4
C) 7 D) 10

16. The hotspots of biodiversity regions generally include

- A) Richness of species B) Richness in endemic species
C) Both A and B D) Richness in biotic and abiotic factors

ಜೀವವೈವಿಧ್ಯತೆ ಪ್ರದೇಶದ ಹಾಟ್‌ಸ್ಪಾಟ್‌ಗಳು ಇವುಗಳನ್ನು ಹೊಂದಿವೆ.

- A) ಜೈವಿಕ ಸಂಪನ್ಮೂಲಗಳು B) ಅಪಾಯದಲ್ಲಿರುವ ಜಾತಿ ಸಂಪನ್ಮೂಲಗಳು
C) A ಮತ್ತು B ಎರಡೂ D) ಜೈವಿಕ ಮತ್ತು ಅಜೈವಿಕ ಸಂಪನ್ಮೂಲಗಳು

17. The historical monument that is affected by acid-rain is

- A) Taj-Mahal B) Pyramid of Egypt
C) Pisa-tower D) Golden Temple

ಯಾವ ಐತಿಹಾಸಿಕ ಕಟ್ಟಡವು ಆಮ್ಲ ಮಳೆಯಿಂದ ಹಾನಿಗೊಳಗಾಗಿದೆ.

- A) ತಾಜ್-ಮಹಲ್ B) ಇಜಿಪ್ಟನ ಪಿರಾಮಿಡ್
C) ಪಿಸಾ ಟಾವರ್ D) ಗೋಲ್ಡನ್ ಟೆಂಪಲ್

18. DDT is _____

- A) Degradable B) Bio-degradable
C) Non-degradable D) Renewable

DDT ಇದು _____

- A) ಕೊಳೆಯುವಂತಹದು B) ಜೈವಿಕ ವಿಘಟನೆಯಾಗುವುದು
C) ಕೊಳೆಯದೆ ಇರುವಂತಹದು D) ನವೀಕರಿಸಬಹುದಾದ



19. Acid-rain contains

- A) Sulphuric acid
B) Hydrochloric acid
C) Oxalic acid
D) Acetic acid

ಆಮ್ಲ-ಮಳೆಯು ಇದನ್ನು ಹೊಂದಿರುತ್ತದೆ.

- A) ಸಲ್ಫೂರಿಕ್ ಆಸಿಡ್
B) ಹೈಡ್ರೋಕ್ಲೋರಿಕ್ ಆಮ್ಲ
C) ಆಕ್ಸಾಲಿಕ್ ಆಸಿಡ್
D) ಅಸೀಟಿಕ್ ಆಸಿಡ್

20. Environment protection act has been passed in the year.

- A) 1968
B) 1936
C) 1986
D) 1948

ಪರಿಸರ ರಕ್ಷಣಾ ಅಕ್ಟನ್ನು ಈ ವರ್ಷ ಕಾರ್ಯಗತ ಮಾಡಲಾಯಿತು

- A) 1968
B) 1936
C) 1986
D) 1948

21. Drinking water contamination causes _____

- A) Scurvy
B) Typhoid
C) Malaria
D) Anaemia

ಕುಡಿಯುವ ನೀರಿನ ಅನೈರ್ಮಲ್ಯೀಕರಣಕ್ಕೆ ಕಾರಣ _____

- A) ಸ್ಕರ್ವಿ
B) ಥೈರಾಯಿಡ್
C) ಮಲೇರಿಯಾ
D) ಅನೇಮಿಯಾ

22. Which of the following is Air-pollutant?

- A) Co
B) O₂
C) N₂
D) All of the above

ಈ ಕೆಳಗಿನ ಯಾವುದು ಗಾಳಿ-ಮಾಲಿನ್ಯಕಾರಕವಾಗಿದೆ.

- A) Co
B) O₂
C) N₂
D) ಮೇಲಿನ ಎಲ್ಲವೂ

23. Vermicomposting is a method of

- A) Producing Compost manure
B) Producing worms
C) Management of fabric waste
D) Destroying worms

ಜೈವಿಕ-ವಿಘಟನಾ ವಿಧಾನವು

- A) ಮ್ಯಾನುರ್ ತಯಾರಿಸುವುದು
B) ವರ್ಮಗಳನ್ನು ತಯಾರಿಸುವುದು
C) ಪ್ಯಾಬ್ರಿಕ್ ತ್ಯಾಜ್ಯವನ್ನು ನಿರ್ವಹಿಸುವುದು
D) ವರ್ಮಗಳಿಗೆ ಹಾನಿಮಾಡುವುದು

24. Ozone - layer is present in

- A) Mesosphere
B) Troposphere
C) Stratosphere
D) Ionosphere

ಓಜೋನ್ ಪದರವು ಈ ಸ್ಥಳದಲ್ಲಿದೆ.

- A) ಮೀಸೋಸ್ಪಿಯರ್
B) ಟ್ರೋಪೋಸ್ಪಿಯರ್
C) ಸ್ಟ್ರಾಟೋಸ್ಪಿಯರ್
D) ಆಯನೋ ಸ್ಪಿಯರ್

[P.T.O.]



25. The wildlife-protection act was enacted in the year
A) 1986 B) 1974
C) 1994 D) 1972
ವನ್ಯಜೀವಿ ಸಂರಕ್ಷಣಾ ಕಾಯ್ದೆ ಜಾರಿಗೆ ಬಂದ ವರ್ಷ.
A) 1986 B) 1974
C) 1994 D) 1972
26. The international protocol to protect ozone layer is
A) Vienna Protocol B) Kyoto Protocol
C) Cartagena protocol D) Montreal protocol
ಜಾಗತಿಕ ಓಜೋನ್ ಪದರ ಸಂರಕ್ಷಣಾ ಪ್ರೋಟೋಕಾಲ್
A) ವಿಯಾನ್ನಾ ಪ್ರೋಟೋಕಾಲ್ B) ಕ್ಯೂಟೋ ಪ್ರೋಟೋಕಾಲ್
C) ಕಾರ್ಟೆಜನಾ ಪ್ರೋಟೋಕಾಲ್ D) ಮಾಂಟ್ರಿಯಲ್ ಪ್ರೋಟೋಕಾಲ್
27. The most prevalent form of land degradation in India is
A) Landslide B) Soil-Subsidence
C) Soil erosion D) Desertification
ಭೂಹಾನಿಗೆ ಕಾರಣವಾದ ಅತಿ ಮುಖ್ಯ ಅಂಶವು
A) ಲ್ಯಾಂಡ್ ಸ್ಲೇಡ್ B) ಸಾಯಿಲ್ ಸಬ್ಸಿಡೆನ್ಸ್
C) ಸಾಯಿಲ್ ಇರೋಜನ್ D) ಡಿಸರ್ಟಿಫಿಕೇಶನ್
28. Enrichment of water body by phosphorus and nitrogen is
A) Succesion B) Eutrophication
C) Stratification D) Precipitation
ಜಲಮೂಲಗಳು ಫಾಸ್ಫರಸ್ ಮತ್ತು ನೈಟ್ರೋಜನ್‌ನಿಂದ ಭರಿತವಾಗಿರುವುದಕ್ಕೆ ಕಾರಣ
A) ಸಕ್ಸೇಶನ್ B) ಯುಟ್ರೋಫಿಕೇಶನ್
C) ಸ್ಟ್ರಾಟಿಫಿಕೇಶನ್ D) ಪ್ರೆಸಿಪಿಟೇಶನ್
29. Birth rate of population is called
A) Mortality B) Vital index
C) Natality D) None of these
ಜನನ ಪ್ರಮಾಣದ ಜನಸಂಖ್ಯೆಯು
A) ಮರಣ ಪ್ರಮಾಣ B) ವೈಟಲ್ ಇಂಡೆಕ್ಸ್
C) ಜನ್ಮಜಾತ D) ಯಾವುದು ಅಲ್ಲ
30. World water day is observed on
A) 22 March B) 23 March
C) 24 March D) 28 March
ಜಾಗತಿಕ ನೀರಿನ ದಿನವನ್ನು ಈ ದಿನ ಆಚರಿಸುತ್ತಾರೆ.
A) 22ನೇ ಮಾರ್ಚ್ B) 23ನೇ ಮಾರ್ಚ್
C) 24ನೇ ಮಾರ್ಚ್ D) 28ನೇ ಮಾರ್ಚ್



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II Semester All UG Courses (NEP) Examination, October - 2023
ENVIRONMENTAL STUDIES (AECC)
DESCRIPTION

Time : 1½ Hours

Maximum Marks : 30

Instructions to Candidates:

Answer for Section - I and II compulsory

SECTION - A**ವಿಭಾಗ - ಅ**Answer any **Five** of the following.

(5×2=10)

ಈ ಕೆಳಗಿನ ಯಾವುದಾದರೂ 5 ಪ್ರಶ್ನೆಗಳಿಗೆ ಉತ್ತರಿಸಿ.

1. Environment
ಪರಿಸರ
2. Ecosystem
ಪರಿಸರ ವ್ಯವಸ್ಥೆ
3. Biodiversity hotspots
ಜೀವವೈವಿಧ್ಯದ ಸೂಕ್ಷ್ಮ ಪ್ರದೇಶಗಳು
4. Ex-situ conservation
ಕೃತಕ ಸಂರಕ್ಷಣೆ
5. Pollution
ಪರಿಸರ ಮಾಲಿನ್ಯ
6. Global warming
ಜಾಗತಿಕ ತಾಪಮಾನ
7. CBD
ಸಿಬಿಡಿ

SECTION - B**ವಿಭಾಗ - ಬ**Answer any **Four** of the following.

(4×5=20)

ಯಾವುದಾದರೂ 4ಕ್ಕೆ ಉತ್ತರಿಸಿರಿ.

8. What are energy sources? Describe any one of alternative energy source.
ಶಕ್ತಿಯ ಮೂಲ ಎಂದರೇನು? ಯಾವುದಾದರೂ ಒಂದು ಪರ್ಯಾಯ ಶಕ್ತಿಯ ಮೂಲವನ್ನು ವಿವರಿಸಿ.
9. Describe grass land ecosystem
ಹುಲ್ಲುಗಾವಲು ಪರಿಸರ ವ್ಯವಸ್ಥೆಯನ್ನು ವಿವರಿಸಿರಿ.
10. Mention Biogeographic zones of India. Describe any one of them.
ಭಾರತದ ಜೈವಿಕ ಭೌಗೋಳಿಕ ವಲಯಗಳನ್ನು ಹೆಸರಿಸಿ ಅವುಗಳಲ್ಲಿ ಒಂದನ್ನು ವಿವರಿಸಿ.
11. What is pollution? Describe air pollution types and its effects and control measures.
ಪರಿಸರ ಮಾಲಿನ್ಯ ಎಂದರೇನು? ವಾಯು ಮಾಲಿನ್ಯದ ಬಗೆಗಳು ಮತ್ತು ಪರಿಣಾಮಗಳು ಮತ್ತು ನಿಯಂತ್ರಣ ವಿಧಗಳನ್ನು ವಿವರಿಸಿ.
12. Describe impact of human population on environment.
ಪರಿಸರದ ಮೇಲೆ ಜನಸಂಖ್ಯೆಯ ಪರಿಣಾಮಗಳನ್ನು ವಿವರಿಸಿ.
13. Write a note on Role of Indian and other religions in environmental conservation.
ಪರಿಸರ ಸಂರಕ್ಷಣೆಯಲ್ಲಿ ಭಾರತದ ವಿವಿಧ ಸಂಪ್ರದಾಯಗಳ ಪಾತ್ರಗಳನ್ನು ವಿವರಿಸಿ. [P.T.O.]

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II Semester B.Sc. (NEP) Degree Examination, October - 2023

CHEMISTRY (DSC)

(Regular/Repeater)

Time : 2 Hours

Maximum Marks : 60

- Instructions to Candidates:**
- 1) All questions are compulsory
 - 2) Draw neat diagrams and give equations wherever necessary.

1. Answer any SIX of the following questions. (6×2=12)

- a) What is lattice energy ? Give its significance.
- b) Write two characteristics of bonding molecular orbitals
- c) Compare the acidic strength of acetic acid and benzoic acid and give the reason.
- d) What is racemic mixture?
- e) Write two applications of liquid crystals.
- f) Define space lattice.
- g) How half life period is related to initial concentration of reactant for zero order and second order reactions.
- h) Define coefficient of viscosity.

2. Answer any THREE of the following questions. (3×4=12)

- a) Calculate the lattice energy of NaCl using the born-Haber cycle from following data
Hent of sublimation of sodium = 108 kJ/mol
Ionisation energy of sodium gas = 495 kJ/mol
Dissociation energy of chlorine = 240 kJ/mol
Electron affinity of chlorine = - 347 kJ/mol
Heat of formation of NaCl = -381 kJ/mol
- b) What is Ionic bond? Write the general characteristics of ionic compounds.
- c) Explain the hybridization and geometry of pcls molecule.
- d) Give the molecular orbital energy level diagram for O_2^+ ion and write its molecular orbital configuration and magnetic property.

[P.T.O.]





3. Answer any THREE of the following questions. (3×4=12)
- What is geometrical isomerism? Write the conditions of geometrical isomerism.
 - Explain
 - Chirality
 - Mesocompounds
 - Discuss the rules of assigning E and Z notations for compounds with examples.
 - Give the rules of assigning R and S notations for compounds with examples.
4. Answer any THREE of the following questions. (3×4=12)
- What are liquid crystals? Give the classification of liquid crystals.
 - Derive the Bragg's equation.
 - Write about laws of crystallography
 - Calculate the separation between two successive planes in a crystal in which a series of planes produce a first order reflection from x-rays of 1.539\AA wavelength at an angle of 22.5°
5. Answer any THREE of the following questions. (3×4=12)
- Derive an expression for rate constant of second order reaction when concentration of reactants are equal.
 - Explain the structural elucidation of Benzoguinone by paractor values.
 - Write about following.
 - Molar refraction
 - Structure of DMG and its use in inorganic analysis.
 - A second order reaction with reactants of equal concentrations is 20% completed in 500 seconds calculate
 - Rate constant of reaction
 - Time for 60% completion of reaction.
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II Semester B.Sc. (NEP) Degree Examination, October - 2023

CHEMISTRY (DSC)

(Regular/Repeater)

Time : 2 Hours

Maximum Marks : 60

- Instructions to Candidates:**
- 1) All questions are compulsory
 - 2) Draw neat diagrams and give equations wherever necessary.

1. Answer any SIX of the following questions. (6×2=12)

- a) What is lattice energy ? Give its significance.
- b) Write two characteristics of bonding molecular orbitals
- c) Compare the acidic strength of acetic acid and benzoic acid and give the reason.
- d) What is racemic mixture?
- e) Write two applications of liquid crystals.
- f) Define space lattice.
- g) How half life period is related to initial concentration of reactant for zero order and second order reactions.
- h) Define coefficient of viscosity.

2. Answer any THREE of the following questions. (3×4=12)

- a) Calculate the lattice energy of NaCl using the born-Haber cycle from following data
 Heat of sublimation of sodium = 108 kJ/mol
 Ionisation energy of sodium gas = 495 kJ/mol
 Dissociation energy of chlorine = 240 kJ/mol
 Electron affinity of chlorine = - 347 kJ/mol
 Heat of formation of NaCl = -381 kJ/mol
- b) What is Ionic bond? Write the general characteristics of ionic compounds.
- c) Explain the hybridization and geometry of pcls molecule.
- d) Give the molecular orbital energy level diagram for O^{+1}_2 ion and write its molecular orbital configuration and magnetic property.

[P.T.O.]



3. Answer any THREE of the following questions.

(3×4=12)

- a) What is geometrical isomerism? Write the conditions of geometrical isomerism.
- b) Explain
 - i) Chirality
 - ii) Mesocompounds
- c) Discuss the rules of assigning E and Z notations for compounds with examples.
- d) Give the rules of assigning R and S notations for compounds with examples.

4. Answer any THREE of the following questions.

(3×4=12)

- a) What are liquid crystals? Give the classification of liquid crystals.
- b) Derive the Bragg's equation.
- c) Write about laws of crystallography
- d) Calculate the separation between two successive planes in a crystal in which a series of planes produce a first order reflection from x-rays of 1.539\AA wavelength at an angle of 22.5°

5. Answer any THREE of the following questions.

(3×4=12)

- a) Derive an expression for rate constant of second order reaction when concentration of reactants are equal.
 - b) Explain the structural elucidation of Benzoinone by paractor values.
 - c) Write about following.
 - i) Molar refraction
 - ii) Structure of DMG and its use in inorganic analysis.
 - d) A second order reaction with reactants of equal concentrations is 20% completed in 500 seconds calculate
 - i) Rate constant of reaction
 - ii) Time for 60% completion of reaction.
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II Semester B.Sc. 6 (NEP) Degree Examination, October - 2023

MATHEMATICS

Algebra - II and Calculus - II

Paper : DSC

(Regular)

Time : 2 Hours

Maximum Marks : 60

Instructions to Candidates: Answer all questions.

Answer any Six questions.

(6 × 2 = 12)

1. a) Define bounded set and give an example.
- b) Define limit point of a set.
- c) Prove that every cyclic group is abelian.
- d) Define left and right cosets.

e) If $u = \tan^{-1}\left(\frac{y}{x}\right)$ then find $\frac{\partial u}{\partial x}$ and $\frac{\partial u}{\partial y}$

f) If $x = u(1-v)$, $y = uv$ then find $\frac{\partial(x,y)}{\partial(u,v)}$

g) Evaluate $\int_0^1 \int_0^2 xy(x+y) dx dy$.

h) Evaluate $\int_0^1 \int_0^2 \int_0^3 (x+y+z) dx dy dz$.

Answer any THREE of the following.

(3 × 4 = 12)

2. a) Prove that the unit interval $[0,1]$ is uncountable.
- b) State and prove Archimedian Property of real numbers

P.T.O.





- c) i) Define open set and give an example.
ii) Prove that the union of a finite number of closed sets is a closed set.
d) Prove that every infinite subset of a denumerable set is denumerable.

Answer any THREE of the following. (3 × 4 = 12)

3. a) If $G = \{1, 5, 7, 11\}$ then prove that G is abelian group w.r.t multiplication module 12.
b) A non empty subset H of a group $(G, *)$ is a sub group of G iff
i) $\forall a, b \in H \Rightarrow a * b \in H$
ii) $\forall a \in H \Rightarrow a^{-1} \in H$.
c) Prove that every subgroup of a cyclic group is cyclic.
d) State and prove Lagrange's theorem for groups.

Answer any THREE of the following. (3 × 4 = 12)

4. a) If $u = \frac{1}{\sqrt{x^2 + y^2 + z^2}}$ then show that $\frac{\partial^2 u}{\partial x^2} + \frac{\partial^2 u}{\partial y^2} + \frac{\partial^2 u}{\partial z^2} = 0$
b) State and prove Euler's theorem for homogeneous function.
c) if $J = \frac{\partial(u, v)}{\partial(x, y)}$, $J^1 = \frac{\partial(x, y)}{\partial(u, v)}$ then prove that $JJ^1 = 1$
d) Expand $\sin(x + y)$ by Maclaurian's series.

Answer any THREE of the following. (3 × 4 = 12)

5. a) Evaluate $\iint_D (x + 2y + 1) dx dy$, where D is domain bounded by $x = 0, y = 0, 3x + y - 3 = 0$.
b) Find the area of the circle $x^2 + y^2 = a^2$ by double integration.
c) Find the volume of the tetrahedron bounded by the coordinate planes and the plane $x + y + z = 1$
d) State and prove Leibnitz's theorem for differentiation under integral sing.



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II Semester B.Sc.4. Degree Examination, October - 2023

MATHEMATICS

Differential And Integral Calculus

Paper - I

(Repeater)

(W.e.f. 2017-2018 onwards)

Time : 3 Hours

Maximum Marks : 80

Instructions to Candidates : Question paper contains 3 parts namely A,B,C Answer all parts.

Part - A

1. Answer any Ten of the following. (10×2=20)
- Find the angle between the radius vector and tang cut to the curve $r = a \cos \theta$.
 - Find the length of the polar subtangent for the curve $r = a \theta$.
 - Find the pedal equation of $r^2 = a^2 \cos 2\theta$.
 - Write the formula for co-ordinate of the centre of curvature.
 - Find the radius of curvature of the curve $2ap^2 = r^3$.
 - Prove that $\lim_{(x,y) \rightarrow (0,0)} \frac{x^2 - y^2}{x^2 + y^2}$ does not exist.
 - If $z = x^2 \sin(3x + y^2)$ find $\frac{\partial z}{\partial x}, \frac{\partial z}{\partial y}$.
 - If $x = r \cos \theta, y = r \sin \theta$ show that $\frac{\partial r}{\partial x} = \frac{x}{\sqrt{x^2 + y^2}}$.
 - Prove that the curve $y = \log x$ convex upwards everywhere.
 - Find the envelope of the family of straight lines $y = m(m+x)$, where 'm' is a parameter.
 - Evaluate $\int \sin^5 x \, dx$ by using reduction formula.
 - Obtain the reduction formula for $\int x^n e^{ax} \, dx$.

Part - B

Answer any Four of the following.

(4×5=20)

2. Derive $\frac{1}{p^2} = \frac{1}{r^2} + \frac{1}{r^4} \left(\frac{dr}{d\theta} \right)^2$ with usual notation.

P.T.O.

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II Semester B.Sc.4. Degree Examination, October - 2023

MATHEMATICS

Differential And Integral Calculus

Paper - I

(Repeater)

(W.e.f. 2017-2018 onwards)

Time : 3 Hours

Maximum Marks : 80

Instructions to Candidates : Question paper contains 3 parts namely A,B,C Answer all parts.

Part - A

1. Answer any Ten of the following.

(10×2=20)

- Find the angle between the radius vector and tang cut to the curve $r = a \cos \theta$.
- Find the length of the polar subtangent for the curve $r = a\theta$.
- Find the pedal equation of $r^2 = a^2 \cos 2\theta$.
- Write the formula for co-ordinate of the centre of curvature.
- Find the radius of curvature of the curve $2ap^2 = r^3$.
- Prove that $\lim_{(x,y) \rightarrow (0,0)} \frac{x^2 - y^2}{x^2 + y^2}$ does not exist.
- If $z = x^2 \sin(3x + y^2)$ find $\frac{\partial z}{\partial x}, \frac{\partial z}{\partial y}$.
- If $x = r \cos \theta, y = r \sin \theta$ show that $\frac{\partial r}{\partial x} = \frac{x}{\sqrt{x^2 + y^2}}$.
- Prove that the curve $y = \log x$ convex upwards everywhere.
- Find the envelope of the family of straight lines $y = m(m+x)$, where 'm' is a parameter.
- Evaluate $\int \sin^5 x \, dx$ by using reduction formula.
- Obtain the reduction formula for $\int x^n e^{ax} \, dx$.

Part - B

Answer any Four of the following.

(4×5=20)

- Derive $\frac{1}{p^2} = \frac{1}{r^2} + \frac{1}{r^4} \left(\frac{dr}{d\theta} \right)^2$ with usual notation.

P.T.O.



3. Find the angle of intersection of the curves $r = a \cos \theta$ and $2r = a$.
4. Find the radius of curvature at any point on the curve $y = a \log \sec \left(\frac{x}{a} \right)$.
5. If $z = x^2 \tan^{-1} \frac{y}{x} - y^2 \tan^{-1} \frac{x}{y}$ show that $\frac{\partial^2 z}{\partial x \partial y} = \frac{x^2 - y^2}{x^2 + y^2}$.
6. Find the envelope of the family of curves $y = mx + a\sqrt{1+m^2}$.
7. Find the reduction formula for $\int \operatorname{cosec}^n x dx$.

PART - C

Answer any Four of the following.

(4×10=40)

8. a. With usual notation prove that $\tan \phi = r \cdot \frac{d\theta}{dr}$.
- b. Obtain pedal equation of the circle $x^2 + y^2 = 2aX$.
9. a. Prove that the radius of curvature in pedal form is $\delta = r \cdot \frac{dr}{dp}$.
- b. Find the evolute of the parabola $y^2 = 4ax$.
10. a. State and prove Euler's theorem for homogeneous function in x and y of degree n .
- b. If $u = \operatorname{Sin}^{-1} \left\{ \frac{x^2 + y^2}{x + y} \right\}$ then show that $x \frac{\partial u}{\partial x} + y \frac{\partial u}{\partial y} = \tan u$.
11. a. Find the range of values of x for which the curve $y = (x^2 + 4x + 5)e^{-x}$ is concave upwards and concave downwards.
- b. Find all the asymptotes of the curve $y^3 - x^2y + 2y^2 + 4y + 1 = 0$.
12. a. Find reduction formula for $\int \cos^n x dx$.
- b. Evaluate $\int_0^1 \frac{x^6}{\sqrt{1-x^2}} dx$.



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II Semester B.Sc.(NEP) Degree Examination, September/October - 2023

ENGLISH

Generic English - II

(Regular)

Time : 2 Hours

Maximum Marks : 60

I. Answer the following in a word, a phrase or a sentence each. (10×1=10)

- 1) What were grown during 1000 to 500 BC?
- 2) What is alternative to the Green Revolution methods?
- 3) What are the two little courtesies expressed in on saying please.
- 4) Who threw the passenger out of the lift?
- 5) Who followed Milkha Singh wherever he went?
- 6) What was the focus of Milkha Singh?
- 7) How many hours did W.B. yeats pray for his daughter?
- 8) What does 'reverie' mean in the poem a prayer for my daughter?
- 9) How does the speaker laugh like?
- 10) How to come up in life?

II. 1) Describe practice sessions of Milkha singh? (1×10=10)

(OR)

- 2) Explain ZBNF as a chemical free farming.

III. 1) How does Maya Angelou assert her dignity and resilience in the poem 'Still I Rise'?

(1×10=10)

(OR)

- 2) What virtues does the Poet want his daughter to be blessed with?

IV. A. Rewrite as directed

(5×2=10)

- 1) Give the synonyms of the following

- i) Cute
- ii) Create

[P.T.O.]



2) Use the following homophones in your own sentences (any one)

i) Brake-Break

(OR)

ii) Diary-Dairy

3) Fill in the blanks with appropriate form of words given in the bracket adding affixes.

i) Scientists try to ----- their ideas (code)

ii) Bharat is a popular ----- in the North karnataka (sing).

4) Match the words in column 'A' with its collective words in column 'B'.

A

B

i) Brain

Storm/wind/sharp

ii). Pony

tail/head/ fish

5) Bring out the difference in meaning of the following pair of words by using them in your own sentences Advice - Advise.

(OR)

B. 1) Read the following passage carefully and identify the technical terms related to the field of and write in the answer script. (5)

A press release is a short yet compelling news story It is written by a public relations professional and sent to targeted members of the media Its goal is to press release the interest of a community or business. The press release contains information for the journalists.

2) a) Write a note Types of Listening (1×5=5)

(OR)

b) Techniques to improve the listening skills.

V. Answer any Two of the following.

(2×5=10)

1) Change into Indirect Speech

a) Ashita said 'when are you leaving'?

b) He said ' I am going out'.

c) Rama said ' I had already left'.

d) Sita said 'where do they stay'?

e) Kavita said 'shall we begin'?



(3)

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- 2) Write an imaginary dialogue between you and your friend about the independence Day Preparations
- 3) Explain verbal and Non. Verbal communication.
- 4) Summarize the following passage in your own words and give a suitable title.

Student life involves walking up early in the morning, rushing to school or college, completing assignments, studying, learning, gaining an education etc. Apart from these we also learn many sports and skills that usually help us in the future, Generally student life is considered the best part of our life.

VI. Answer any two of the following

(2×5=10)

- 1) Draft a copy of speech on Swachh Bharat Abhiyan
- 2) Write a brief essay on science for peace and development.
- 3) Write a short paragraph on 'Bhagat Singh'.
- 4) Translate the following paragraph into Kannada or Hindi or Marathi or Urdu .

Ashita was on a long road trip outside the city to reach her project site, Lates, on the way her car got a break down, she tried hard but couldn't restart the car. But soon a young man with a peaceful grin on his face knocked on her car window said 'Sister do you need a any help. Ashita was surprised to see the young man suddenly appearing from nowhere on the dark lonely road.



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II Semester B.Sc. (NEP) Degree Examination, September/October - 2023

KANNADA (Basic)

ತೆರೆದ ಮನ (ಎಇಸಿಸಿ)

(Regular)

Time : 2 Hours

Maximum Marks : 60

Instructions to Candidates:

ಭಾಷೆ ಮತ್ತು ಬರಹದ ಕುಡ್ಧಿಯನ್ನು ಗಮನಿಸಲಾಗುವುದು.

- I** a) ಜ್ಯೋತಿರಡ್ಡಿ ತನ್ನ ಬದುಕನ್ನು ಕಟ್ಟಿಕೊಂಡ ಪ್ರಸಂಗವನ್ನು ಕುರಿತು ವಿವರಿಸಿರಿ. (10)
(ಅಥವಾ)
- b) ಎಲ್ಲಾ ಕಲೆಗಳಲ್ಲಿ ಶ್ರೇಷ್ಠವಾದ ಕಲೆ 'ಜೀವನ ಕಲೆ' ಎಂಬುದನ್ನು ಡಿ.ವಿ.ಜಿ. ಯವರ ಮಂಕುತಿಮ್ಮನ ಕಗ್ಗದ ಹಿನ್ನೆಲೆಯಲ್ಲಿ ನಿರೂಪಿಸಿರಿ.
- II** a) 'ನನ್ನ ಇಷ್ಟದ ಪುಸ್ತಕಗಳು' ವ್ಯಕ್ತಿಯ ವ್ಯಕ್ತಿತ್ವವನ್ನು ರೂಪಿಸುತ್ತವೆ? ಎನ್ನುವ ಲೇಖಕರ ವಿಚಾರಗಳನ್ನು ಸಂಗ್ರಹಿಸಿ ಬರೆಯಿರಿ. (10)
(ಅಥವಾ)
- b) ಅಕ್ಕಮಹಾದೇವಿ ಚೆನ್ನಮಲ್ಲಿಕಾರ್ಜುನನ್ನು ಕುರಿತು ಕನಸಿನ ವೃತ್ತಾಂತವೇನು? ವಿವರಿಸಿರಿ.
- III** a) 'ಮಳೆ ನಿಂತ ಮೇಲೆ' ಈ ಕಥೆಯ ಬಡತನದ ದಾರುಣತೆಯನ್ನು ಎತ್ತಿ ತೋರಿಸುತ್ತದೆ? ವಿವರಿಸಿರಿ (10)
(ಅಥವಾ)
- b) 'ನಾನು ಪುಟ್ಟ ಮಳೆ ನೋಡಿದ್ದು' ಕವಿತೆಯ ವೈಶಿಷ್ಟ್ಯತೆಗಳನ್ನು ವಿವರಿಸಿರಿ.
- IV** a) ಕಾಫಿ ಚಟ ಅನುವಂಶಿಕವೆ? ಪರಿಸರ ಪ್ರೇರಿತವೆ? ಎಂಬುದನ್ನು ವಿವರಿಸಿರಿ. (10)
(ಅಥವಾ)
- b) 'ವಿಗ್ರಹಗಳೋಗ್ರಹಗಳೋ' ಸಂಬಂಧವನ್ನು ಕುರಿತು ಲೇಖಕರ ಅಭಿಪ್ರಾಯಗಳನ್ನು ಸಂಗ್ರಹಿಸಿ ವಿವರಿಸಿರಿ.

[P.T.O.]

V. ಟಿಪ್ಪಣಿ ಬರೆಯಿರಿ ಬೇಕಾದ ಎರಡಕ್ಕೆ

(2×5=10)

- ಆದರ್ಶ ಜೀವನ.
- ಚೈತನ್ಯದ ಪೂಜೆ.
- ಧನಿಯರ ಸತ್ಯ ನಾರಾಯಣ.
- ನ್ಯಾನೋ ತಂತ್ರಜ್ಞಾನ.

VI. ಒಂದೇ ವಾಕ್ಯದಲ್ಲಿ ಉತ್ತರಿಸಿರಿ.

(10×1=10)

- ಡಿ.ವಿ.ಜಿ. ಅವರ ಪೂರ್ಣ ಹೆಸರೇನು?
- ಪಾಟೀಲ ಪುಟ್ಟಪ್ಪ ಅವರ ಜನ್ಮಸ್ಥಳ ಯಾವುದು?
- ಡಾ.ಎಚ್. ನರಸಿಂಹಯ್ಯನವರಿಗೆ 1985 ರಲ್ಲಿ ಯಾವ ಪ್ರಶಸ್ತಿ ದೊರಕಿದೆ?
- ಅಂಬಿಕಾತನಯದತ್ತ ಇದು ಯಾರ ಕಾವ್ಯನಾಮ?
- ಕುವೆಂಪು ಅವರ ತಂದೆ-ತಾಯಿಯ ಹೆಸರೇನು?
- ತೌಡನ ಹೆಂಡತಿಯ ಹೆಸರೇನು?
- ಆಕಾಶಬುಟ್ಟಿ ಇದು ಯಾರ ಕೃತಿ?
- 'ಬರ' ಈ ಕಥೆಯನ್ನು ಯಾವ ಪುಸ್ತಕದಿಂದ ಆಯ್ದುಕೊಳ್ಳಲಾಗಿದೆ?
- ಜೆ.ಆರ್. ಲಕ್ಷ್ಮಣರಾವ್ ಅವರು ಯಾವ ವರ್ಷ ಜನಿಸಿದರು?
- 'ಅಮ್ಮ ಹೇಳಿದ ಎಂಟು ಸುಳ್ಳುಗಳು' ಈ ಕೃತಿಗೆ ಯಾವ ಪ್ರಶಸ್ತಿ ದೊರಕಿದೆ?

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II Semester B.Sc. (NEP) Degree Examination, September/October - 2023

KANNADA (Basic)

ತೆರೆದ ಮನ (ಎಇಸಿಸಿ)

(Regular)

Time : 2 Hours

Maximum Marks : 60

Instructions to Candidates:

ಭಾಷೆ ಮತ್ತು ಬರಹದ ಶುದ್ಧಿಯನ್ನು ಗಮನಿಸಲಾಗುವುದು.

- I a) ಜ್ಯೋತಿರಣ್ಣ ತನ್ನ ಬದುಕನ್ನು ಕಟ್ಟಿಕೊಂಡ ಪ್ರಸಂಗವನ್ನು ಕುರಿತು ವಿವರಿಸಿರಿ. (10)
(ಅಥವಾ)
b) ಎಲ್ಲಾ ಕಲೆಗಳಲ್ಲಿ ಶ್ರೇಷ್ಠವಾದ ಕಲೆ 'ಜೀವನ ಕಲೆ' ಎಂಬುದನ್ನು ಡಿ.ವಿ.ಜಿ. ಯವರ ಮಂಕುತಿಮ್ಮನ ಕಗ್ಗದ ಹಿನ್ನೆಲೆಯಲ್ಲಿ ನಿರೂಪಿಸಿರಿ.
- II a) 'ನನ್ನ ಇಷ್ಟದ ಪುಸ್ತಕಗಳು' ವ್ಯಕ್ತಿಯ ವ್ಯಕ್ತಿತ್ವವನ್ನು ರೂಪಿಸುತ್ತವೆ? ಎನ್ನುವ ಲೇಖಕರ ವಿಚಾರಗಳನ್ನು ಸಂಗ್ರಹಿಸಿ ಬರೆಯಿರಿ. (10)
(ಅಥವಾ)
b) ಅಕ್ಕಮಹಾದೇವಿ ಚೆನ್ನಮಲ್ಲಿಕಾರ್ಜುನನ್ನು ಕುರಿತು ಕನಸಿನ ವೃತ್ತಾಂತವೇನು? ವಿವರಿಸಿರಿ.
- III a) 'ಮಳೆ ನಿಂತ ಮೇಲೆ' ಈ ಕಥೆಯ ಬಡತನದ ದಾರುಣತೆಯನ್ನು ಎತ್ತಿ ತೋರಿಸುತ್ತದೆ? ವಿವರಿಸಿರಿ (10)
(ಅಥವಾ)
b) 'ನಾನು ಪುಟ್ಟ ಮಳೆ ನೋಡಿದ್ದು' ಕವಿತೆಯ ವೈಶಿಷ್ಟ್ಯತೆಗಳನ್ನು ವಿವರಿಸಿರಿ.
- IV a) ಕಾಫಿ ಚಟ ಅನುವಂಶಿಕವೆ? ಪರಿಸರ ಪ್ರೇರಿತವೆ? ಎಂಬುದನ್ನು ವಿವರಿಸಿರಿ. (10)
(ಅಥವಾ)
b) 'ವಿಗ್ರಹಗಳೋಗ್ರಹಗಳೋ' ಸಂಬಂಧವನ್ನು ಕುರಿತು ಲೇಖಕರ ಅಭಿಪ್ರಾಯಗಳನ್ನು ಸಂಗ್ರಹಿಸಿ ವಿವರಿಸಿರಿ.

[P.T.O.]

V. ಟಿಪ್ಪಣಿ ಬರೆಯಿರಿ ಬೇಕಾದ ಎರಡಕ್ಕೆ .

(2×5=10)

- ಆದರ್ಶ ಜೀವನ.
- ಚೈತನ್ಯದ ಪೂಜೆ.
- ಧನಿಯರ ಸತ್ಯ ನಾರಾಯಣ.
- ನ್ಯಾನೋ ತಂತ್ರಜ್ಞಾನ.

VI. ಒಂದೇ ವಾಕ್ಯದಲ್ಲಿ ಉತ್ತರಿಸಿರಿ.

(10×1=10)

- ಡಿ.ವಿ.ಜಿ. ಅವರ ಪೂರ್ಣ ಹೆಸರೇನು?
- ಪಾಟೀಲ ಪುಟ್ಟಪ್ಪ ಅವರ ಜನ್ಮಸ್ಥಳ ಯಾವುದು?
- ಡಾ.ಎಚ್. ನರಸಿಂಹಯ್ಯನವರಿಗೆ 1985 ರಲ್ಲಿ ಯಾವ ಪ್ರಶಸ್ತಿ ದೊರಕಿದೆ?
- ಅಂಬಿಕಾತನಯದತ್ತ ಇದು ಯಾರ ಕಾವ್ಯನಾಮ?
- ಕುವೆಂಪು ಅವರ ತಂದೆ-ತಾಯಿಯ ಹೆಸರೇನು?
- ತೌಡನ ಹೆಂಡತಿಯ ಹೆಸರೇನು?
- ಆಕಾಶಬುಟ್ಟಿ ಇದು ಯಾರ ಕೃತಿ?
- 'ಬರ' ಈ ಕಥೆಯನ್ನು ಯಾವ ಪುಸ್ತಕದಿಂದ ಆಯ್ದುಕೊಳ್ಳಲಾಗಿದೆ?
- ಜೆ.ಆರ್. ಲಕ್ಷ್ಮಣರಾವ್ ಅವರು ಯಾವ ವರ್ಷ ಜನಿಸಿದರು?
- 'ಅಮ್ಮ ಹೇಳಿದ ಎಂಟು ಸುಳ್ಳುಗಳು' ಈ ಕೃತಿಗೆ ಯಾವ ಪ್ರಶಸ್ತಿ ದೊರಕಿದೆ?

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II Semester B.Sc.(NEP) Degree Examination, September/October - 2023

ENGLISH

Generic English - II

(Regular)

Time : 2 Hours

Maximum Marks : 60

I Answer the following in a word, a phrase or a sentence each. (10×1=10)

- 1) What were grown during 1000 to 500 BC?
- 2) What is alternative to the Green Revolution methods?
- 3) What are the two little courtesies expressed in on saying please.
- 4) Who threw the passenger out of the lift?
- 5) Who followed Milkha Singh wherever he went?
- 6) What was the focus of Milkha Singh?
- 7) How many hours did W.B. yeats pray for his daughter?
- 8) What does 'reverie' mean in the poem a prayer for my daughter?
- 9) How does the speaker laugh like?
- 10) How to come up in life?

II. 1) Describe practice sessions of Milkha singh? (1×10=10)

(OR)

- 2) Explain ZBNF as a chemical free farming.

III. 1) How does Maya Angelou assert her dignity and resilience in the poem 'Still I Rise'? (1×10=10)

(OR)

- 2) What virtues does the Poet want his daughter to be blessed with?

IV. A. Rewrite as directed (5×2=10)

- 1) Give the synonyms of the following

- i) Cute
- ii) Create

[P.T.O.]



(2)

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2) Use the following homophones in your own sentences (any one)

i) Brake-Break

(OR)

ii) Diary-Dairy

3) Fill in the blanks with appropriate form of words given in the bracket adding affixes.

i) Scientists try to ----- their ideas (code)

ii) Bharat is a popular ----- in the North karnataka (sing).

4) Match the words in column 'A' with its collective words in column 'B'.

A

B

i) Brain

Storm/wind/sharp

ii). Pony

tail/head/ fish

5) Bring out the difference in meaning of the following pair of words by using them in your own sentences Advice - Advise.

(OR)

B. 1) Read the following passage carefully and identify the technical terms related to the field of and write in the answer script. (5)

A press release is a short yet compelling news story It is written by a public relations professional and sent to targeted members of the media Its goal is to press release the interest of a community or business. The press release contains information for the journalists.

2) a) Write a note Types of Listening (1×5=5)

(OR)

b) Techniques to improve the listening skills.

V. Answer any Two of the following.

(2×5=10)

1) Change into Indirect Speech

a) Ashita said 'when are you leaving'?

b) He said ' I am going out'.

c) Rama said ' I had already left'.

d) Sita said 'where do they stay'?

e) Kavita said 'shall we begin'?

- 2) Write an imaginary dialogue between you and your friend about the independence Day Preparations
- 3) Explain verbal and Non-Verbal communication.
- 4) Summarize the following passage in your own words and give a suitable title.

Student life involves walking up early in the morning, rushing to school or college, completing assignments, studying, learning, gaining an education etc. Apart from these we also learn many sports and skills that usually help us in the future, Generally student life is considered the best part of our life.

VI. Answer any two of the following

(2×5=10)

- 1) Draft a copy of speech on Swachh Bharat Abhiyan
- 2) Write a brief essay on science for peace and development.
- 3) Write a short paragraph on 'Bhagat Singh'.
- 4) Translate the following paragraph into Kannada or Hindi or Marathi or Urdu .

Ashita was on a long road trip outside the city to reach her project site, Lates, on the way her car got a break down, she tried hard but couldn't restart the car. But soon a young man with a peaceful grin on his face knocked on her car window said 'Sister, do you need a any help. Ashita was surprised to see the young man suddenly appearing from nowhere on the dark lonely road.

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II Semester B.Sc. 6 (NEP) Degree Examination, October - 2023

MATHEMATICS

Algebra - II and Calculus - II

Paper : DSC

(Regular)

Time : 2 Hours

Maximum Marks : 60

Instructions to Candidates: Answer all questions.

Answer any Six questions.

(6 × 2 = 12)

1. a) Define bounded set and give an example.
- b) Define limit point of a set.
- c) Prove that every cyclic group is abelian.
- d) Define left and right cosets.
- e) If $u = \tan^{-1}\left(\frac{y}{x}\right)$ then find $\frac{\partial u}{\partial x}$ and $\frac{\partial u}{\partial y}$
- f) If $x = u(1-v)$, $y = uv$ then find $\frac{\partial(x,y)}{\partial(u,v)}$
- g) Evaluate $\int_0^1 \int_0^2 xy(x+y) dx dy$.
- h) Evaluate $\int_0^1 \int_0^2 \int_0^3 (x+y+z) dx dy dz$.

Answer any THREE of the following.

(3 × 4 = 12)

2. a) Prove that the unit interval $[0,1]$ is uncountable.
- b) State and prove Archimedian Property of real numbers

P.T.O.



(2)

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- c) i) Define open set and give an example.
ii) Prove that the union of a finite number of closed sets is a closed set.
d) Prove that every infinite subset of a denumerable set is denumerable.

Answer any THREE of the following.

(3 × 4 = 12)

3. a) If $G = \{1, 5, 7, 11\}$ then prove that G is abelian group w.r.t multiplication module 12.
b) A non empty subset H of a group $(G, *)$ is a sub group of G iff
i) $\forall a, b \in H \Rightarrow a * b \in H$
ii) $\forall a \in H \Rightarrow a^{-1} \in H$.
c) Prove that every subgroup of a cyclic group is cyclic.
d) State and prove Lagrange's theorem for groups.

Answer any THREE of the following.

(3 × 4 = 12)

4. a) If $u = \frac{1}{\sqrt{x^2 + y^2 + z^2}}$ then show that $\frac{\partial^2 u}{\partial x^2} + \frac{\partial^2 u}{\partial y^2} + \frac{\partial^2 u}{\partial z^2} = 0$
b) State and prove Euler's theorem for homogeneous function.
c) if $J = \frac{\partial(u, v)}{\partial(x, y)}$, $J^1 = \frac{\partial(x, y)}{\partial(u, v)}$ then prove that $JJ^1 = 1$
d) Expand $\sin(x + y)$ by Maclaurian's series.

Answer any THREE of the following.

(3 × 4 = 12)

5. a) Evaluate $\iint_D (x + 2y + 1) dx dy$, where D is domain bounded by $x = 0, y = 0, 3x + y - 3 = 0$.
b) Find the area of the circle $x^2 + y^2 = a^2$ by double integration.
c) Find the volume of the tetrahedron bounded by the coordinate planes and the plane $x + y + z = 1$
d) State and prove Leibnitz's theorem for differentiation under integral sing.

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42233/B330

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II Semester B.Sc.4. Degree Examination, October - 2023

MATHEMATICS

Differential And Integral Calculus

Paper - I

(Repeater)

(W.e.f. 2017-2018 onwards)

Time : 3 Hours

Maximum Marks : 80

Instructions to Candidates : Question paper contains 3 parts namely A,B,C Answer all parts.

Part - A

1. Answer any Ten of the following. (10×2=20)

- Find the angle between the radius vector and tang cut to the curve $r = a \cos \theta$.
- Find the length of the polar subtangent for the curve $r = a\theta$.
- Find the pedal equation of $r^2 = a^2 \cos 2\theta$.
- Write the formula for co-ordinate of the centre of curvature.
- Find the radius of curvature of the curve $2ap^2 = r^3$.
- Prove that $\lim_{(x,y) \rightarrow (0,0)} \frac{x^2 - y^2}{x^2 + y^2}$ does not exist.
- If $z = x^2 \sin(3x + y^2)$ find $\frac{\partial z}{\partial x}, \frac{\partial z}{\partial y}$.
- If $x = r \cos \theta, y = r \sin \theta$ show that $\frac{\partial r}{\partial x} = \frac{x}{\sqrt{x^2 + y^2}}$.
- Prove that the curve $y = \log x$ convex upwards everywhere.
- Find the envelope of the family of straight lines $y = m(m+x)$, where 'm' is a parameter.
- Evaluate $\int \sin^5 x \, dx$ by using reduction formula.
- Obtain the reduction formula for $\int x^n e^{ax} \, dx$.

Part - B

Answer any Four of the following.

(4×5=20)

- Derive $\frac{1}{p^2} = \frac{1}{r^2} + \frac{1}{r^4} \left(\frac{dr}{d\theta} \right)^2$ with usual notation.

P.T.O.



(2)

42233/B330

3. Find the angle of intersection of the curves $r = a \cos \theta$ and $2r = a$.
4. Find the radius of curvature at any point on the curve $y = a \log \sec \left(\frac{x}{a} \right)$.
5. If $z = x^2 \tan^{-1} \frac{y}{x} - y^2 \tan^{-1} \frac{x}{y}$ show that $\frac{\partial^2 z}{\partial x \partial y} = \frac{x^2 - y^2}{x^2 + y^2}$.
6. Find the envelope of the family of curves $Y = mx + a\sqrt{1+m^2}$.
7. Find the reduction formula for $\int \operatorname{cosec}^n x dx$.

PART - C**Answer any Four of the following.****(4×10=40)**

8. a. With usual notation prove that $\tan \phi = r \frac{d\theta}{dr}$.
- b. Obtain pedal equation of the circle $x^2 + y^2 = 2aX$.
9. a. Prove that the radius of curvature in pedal form is $\delta = r \frac{dr}{dp}$.
- b. Find the evolute of the parabola $y^2 = 4ax$.
10. a. State and prove Euler's theorem for homogeneous function in x and y of degree n .
- b. If $u = \operatorname{Sin}^{-1} \left\{ \frac{x^2 + y^2}{x + y} \right\}$ then show that $x \frac{\partial u}{\partial x} + y \frac{\partial u}{\partial y} = \tan u$.
11. a. Find the range of values of x for which the curve $y = (x^2 + 4x + 5)e^{-x}$ is concave upwards and concave downwards.
- b. Find all the asymptotes of the curve $y^3 - x^2y + 2y^2 + 4y + 1 = 0$.
12. a. Find reduction formula for $\int \cos^n x dx$.
- b. Evaluate $\int_0^1 \frac{x^6}{\sqrt{1-x^2}} dx$.