

Third Test

Q. 1 Make one sentence each using following phrasal verbs.
I*5= 5

a. break down : - Our car broke down at the side of the highway in the hailstorm.

b. give up :- Try to give up bad habits.

c. carry out :- We should carry out the orders of our parents.

d. look after : -The nurse looked after the patient.

e. keep up:- Keep up your courage in difficulties.

Q.2 Write an essay on

Noise Pollution: Meaning - Sources of noise pollution - Effects of noise pollution - Ways to control noise pollution

NOISE POLLUTION

The word 'Noise' is derived from the Latin word 'nausea' which means feeling of sickness at the stomach with an urge to vomit. The term noise may be defined in a number of ways.

For example:

(i) In acoustic, noise is defined as unwanted, unpleasant and annoying sound.

(ii) Noise is defined as unwanted, unpleasant, disagreeable sound that causes discomfort.

(iii) Noise is defined as the wrong sound, in the wrong place at the wrong time.

(iv) Noise is the sound incidental to our civilization and is without agreeable musical quality.

It is seen that a particular sound which is musical to someone, may be noise to another. However, if the sound is loud and it prolongs for a longer period of time, it becomes noise for all. (The technological advancements such as steam engines, diesel engines, jet engines, industrial machinery, traffic noise of moving trucks, buses, cars, and automobiles with blow horns, etc. are polluting the atmosphere with their continuous noise.

So, now a day's noise is considered as a component of environmental pollution having a potential to cause hazards to human health and communication.) It may be noted that sound is a pure tone, harmonically related, occurring at regular intervals and producing meaning full communication whereas noise is a complex mixture of a number of pure tones of varying

frequencies and amplitudes.

Noise pollution may be defined in a number of ways:

i) According to Odum, noise pollution is the unwanted sound dumped into environment without regard to the adverse effect it may have. (ii) Noise pollution may be defined as any unwanted electromagnetic signal (sound) that produces a jarring or displeasing effect and which interferes with human communication, comfort and health. (iii) According to Ambast (1988), noise pollution is caused when the loudness of the sound becomes irritating or unbearable. (iv) Noise pollution also refers to perturbations which interfere in the communication systems. The unit of sound intensity is decibel (dB). The sound intensity from 0 to 100 dB is pleasant but when the sound intensity exceeds 120 dB, it causes noise. Sound intensity of 130 dB is the upper limit of the threshold of hearing and beyond this, is the threshold of pain which may cause damage to car and leading to hearing impairment. So, sound of more than 130 dB causes noise pollution.

Sources of Noise Pollution:

Noise may originate either from natural sources or from anthropogenic activities. The natural sources of noise include thunder, roaring of sea, etc. The manmade noise are mechanized automobiles, industries, trains, aero planes, social functions etc. It may be noted that the manmade noise is now doubling after every decade.

Broadly speaking, the noise may be classified into:

1. Transport noise:

The main threat of noise comes from transport sector. The transport noise includes road traffic noise, rail traffic noise and aircraft noise.

(a) Road traffic noise: The chief causes of road traffic noise are the number of road vehicles and their high traffic speed. Faster moving vehicles produce high noise from their gear box, exhaust system, vibrations from their body, etc. (b) Rail traffic noise: The noise from rail traffic is comparatively lower than that from road traffic. Introduction of diesel engines or electrical engines has reduced the intensity of rail traffic noise which was previously shown by steam engine. Besides use of welded tracks and improved coach suspension have contributed to the reduction in railways noise. (c) Aircraft noise: Larger and faster aircrafts produce high noise intermittently during takeoff, landing and during flight. Noise generates from compressor and turbine and near jet exhaust. Jet engines create most noise around a radius of 16 km. Sonic boom is an important aspect of aircraft noise. Sonic boom occurs when an aircraft flies supersonically overhead.

2. Industrial noise: The different machines of numerous industries, factories and mills produce a lot of high intensity sounds causing noise pollution. Some industrial processes like weaving, ship building, boiler making, pressing and blasting operations are more noisier than others. The operations in pneumatic drills, milling machines, cutters, printing press with an upward, downward and sideways movement and vibrations, cause lowering of hearing capacity to a large extent.

The noise pollution is further magnified due to the installation of industries in compact places. For example, the workers near the heavy industrial blowers in steel industry are exposed to sound of 120dB for eight hours and hence suffer from occupational pollution.

3. Neighborhood noise:
This type of noise includes antisocial activities of neighbors like using of loud TV, stereo, radio sets, jazz music, fireworks parties, playing of children, barking of dogs, neighborhood brawls out of intoxication and industrial neighborhood noise etc. The machines used in house construction like concrete mixes, vibrators, bulldozers, heavy diesel lorry, building demolition activities also add to the noise pollution.

Effects of Noise Pollution:

Noise is air-borne mechanical energy striking the human eardrum. A sound of 65dB is the noise level for conversation heard at a distance of one meter. A sound of 125dB (A) gives the sensation of pain in the ear and 150dB (A) might kill a human being. If a noise of 90dB in the mid-frequency range reaches the ear for more than few minutes, then the sensitivity of the ear is reduced.

The various effects of noise pollution on human beings may be classified in to two categories:

1. Auditory effects: The impairing of hearing which may cause immediate auditory fatigue finally leading to deafness is known as auditory effects.

2. Non-auditory effects: These effects include interference with speech communication, annoyance leading to ill-temper, bickering, mental disorientation, violent behavior and a series of health hazards.

In addition to serious loss of hearing, noise also causes pathological (or psychological), non-pathological (or physiological) and vibrational disorders.

(a) Pathological disorder:

(i) Exposure to high frequencies or ultrasonic sound above the audible range damages inner ear and induces nausea and dizziness in man. (ii) Exposure to mid-audible frequency affects brain and nervous system having significant impact on thinking and coordination of limbs. (iii) Moderate vibration can lead to pain, numbness and cyanosis (blue coloration) of fingers. (iv) Severe vibration results in damage to bones and joints in the hands with swelling and stiffness. (v) Exposure to low frequency noise can reduce heart beat, variation in blood pressure and breathing difficulties.

(b) Non-pathological disorders:

These disorders are mainly seen in industries and other establishments which result in lower efficiency, reduced work rate, increased absenteeism and a higher potential for accidents and injuries. Noise also disturbs sound sleep of old people. Children exposed to excessive noise show signs of behavioral disorder which in later age manifest themselves in destructive nature.

(c) Vibration (physical vibration) disorder and Reynaud's phenomenon:

(i) Noise from constant vibrations of hand tools like the hammer or drilling instrument creates 'dead hands' or 'white fingers' which is known as Reynaud's phenomenon. (ii) Noise from moderate vibrations causes pain, numbness, and cyanosis. (iii) Noise from severe vibrations causes damage to bones, joints with swelling and stiffness.

Some of the important effects of noise pollution are outlined as given below:

1. It causes contraction of blood vessels, makes the skin pale leads to excessive secretion of adrenaline hormone into blood thereby inducing high blood pressure.

2. It may cause damage to heart, brain, kidney and liver.

3. It induces contraction of muscles which ultimately leads to nervous breakdown, tension and even insanity.

4. It induces anxiety, stress and fight which in turn causes increased heart beat, constriction of blood vessels, dilation of pupil of eye etc. by modulating the hormone content in blood.

5. It damages some part of auditory system thereby causing the impairment of hearing.

6. Excessive noise causes thickening of blood and changes in breathing amplitude.

7. It is responsible for disturbing the entire biological system. For example, the internal wreckage caused by the roar of a jet engine includes gastric ulcer and thymus gland atrophy.

8. It causes irritation, dissatisfaction, disinterest and affects work efficiency.

9. Sudden and explosive sounds cause cracks in buildings and breaking of window doors and glasses.

10. It causes chronic headache and irritability thereby reducing work efficiency.

11. It brings about changes in the behavioral aptitude of birds and animals. For example, noise pollution discourages the annual visit of migratory birds to Alipore Zoo of Kolkata.

12. It interferes with communication systems. For example, sometimes it becomes necessary to raise the volume of our TV set or radio to overcome the impact of external noise.

Prevention and Control of Noise Pollution:

Noise produced from different sources has created a catastrophe to the entire living world specially to man. Hence, necessary steps should be taken to minimize the level of noise thereby protecting the living world from its detrimental effects.

Few methods of minimizing noise pollution are discussed below:

(1) Industrial noise pollution control:

The level of noise pollution due to industries can be lowered down by adopting the following techniques:

(a) Use of improved technique:

The noise at source can be reduced by replacing noise producing machines with suitable improved technique. For example, the noise from exhaust fans can be decreased either by increasing the number of blades or by decreasing the rotational speed.

(b) Sound proofing:
An insulating material may be applied on the noise producing machinery and equipment's which causes sound proofing.

(c) Transmission control:
The level of noise can be minimized by covering the walls of the room by sound absorber (e.g. acoustic tiles), introducing gaskets around the doors and windows, sealing all the outlets and putting carpet, drapery and acoustic materials inside the room.
(d) Creation of green vegetation cover:
Plants and trees should be planted along highways, streets and industrial areas because the vegetation covers absorb and dissipate sound energy and acts as a buffer zone.
(e) Using protective devices:
The use of ear plugs or ear muffs or even cotton balls by the worker in the industry can protect them from hazardous effects of noise pollution.

(f) Operations in open space:
Noisy industrial operations should be conducted at open spaces far off from residential areas.
(g) Use of Building codes:
Certain codes should be enforced which require sound proofing in the construction of industries, buildings and apartments.

2. Community noise control:
The community noise control includes minimization of noise from air traffic, transport system, building constructions etc. The noises from the above sources can be lowered by adopting the following procedures:

(a) The air traffic noise can be reduced either by suitable technique or by zoning the area around the airport and not allowing for the construction of houses or industries within 10 meters of the airport.(b) The road traffic noise includes tyre noise, engine intake noise, exhaust noise, aerodynamic noise, noise from blowing of horns etc. Such type of noise pollution can be controlled by incorporating silencers in vehicles, maintaining speed limit prescribed for the vehicle and banning air horns.(c) The loudspeakers, radio and music system should be operated at threshold intensity so that the noise level should not be hazardous to living organisms.(d) Public awareness should be created to educate the common man about the harmful effects of noise pollution, through radio, television, newspapers etc.(e) The noise can be reduced by introduction of new regulations which mainly include lowering speed limits and designing for non-stop operation.(f) Stringent laws should be implemented to control noise pollution. For

example Motor Vehicle Act of India provides restrictions on heavy vehicles using double sirens while passing through populated areas.(g) The laying of ballast less tracks reduces the noise level due to railways.(h) The noise pollution can best be controlled by promoting education and research.

Q.3 Write a letter to the chairman of the municipal council complaining about the insanitary

conditions in your street.

5

Mohita

7/D, Sec- 17

Dungarpur

March 21, 2018

The Chairman

Municipal Council

Dungarpur

Subject: Insanitary conditions in the locality

Dear Sir

I regret to inform you about the unhealthy conditions prevailing in the seventh street of Block - D, Sector 17. The heaps of garbage have been accumulating on road side. The side drains are not cleaned properly and they are full of stagnant water. The dirty water has been spreading all around. The stagnant water pools are mosquito breeding places. The unhealthy condition can create health problems for the residents of this lane.

I will be grateful if you would take immediate action in this regard.

Yours faithfully

Mohita

7/D, Sec- 17

Dungarpur, Rajasthan

$$z^2 (w - u(z-v) + vuz) = 0.8 \text{ ज्ञान-तंत्र}$$

इसलिए ज्ञान-तंत्र के लिए तालिका है जो
 इसके ज्ञान-तंत्र के फलित है इस प्रकार यह है $z^2 - 0.8z + 0.8z = 0$
 ज्ञान-तंत्र के फलित ज्ञान-तंत्र है: $z^2 - 0.8z + 0.8z = 0$

$$w - u(z-v) + vuz = 0$$

इसलिए कालिका है

जिसका है तालिका है इसका है जो $z^2 - 0.8z + 0.8z = 0$ है
 ज्ञान-तंत्र के फलित ज्ञान-तंत्र है: $z^2 - 0.8z + 0.8z = 0$

ज्ञान-तंत्र के फलित ज्ञान-तंत्र है $z^2 - 0.8z + 0.8z = 0$

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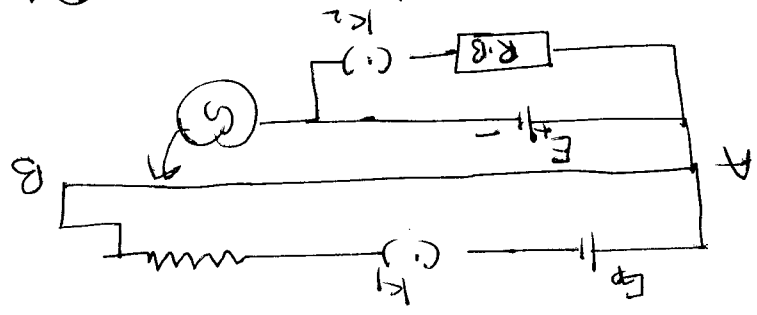
ज्ञान-तंत्र के फलित ज्ञान-तंत्र है $z^2 - 0.8z + 0.8z = 0$

Ans:

विद्युत् प्रवाह की दिशा में धारा i का मान $i = \frac{E}{R + r}$ है, जहाँ R बाह्य प्रतिरोध है और r अन्तर्गत प्रतिरोध है।

यदि $R = r$ हो तो $i = \frac{E}{2r}$ ।
 यदि $R \rightarrow \infty$ हो तो $i \rightarrow 0$ ।
 यदि $R = 0$ हो तो $i = \frac{E}{r}$ ।
 यदि $R = r$ हो तो $i = \frac{E}{2r}$ ।
 यदि $R \rightarrow \infty$ हो तो $i \rightarrow 0$ ।
 यदि $R = 0$ हो तो $i = \frac{E}{r}$ ।

(1) $E = r i$



यदि $R = r$ हो तो $i = \frac{E}{2r}$ ।
 यदि $R \rightarrow \infty$ हो तो $i \rightarrow 0$ ।
 यदि $R = 0$ हो तो $i = \frac{E}{r}$ ।

अतः $i = \frac{E}{R + r}$

(2) $r = \frac{E - V}{V} \times R$

यदि $R = r$ हो तो $i = \frac{E}{2r}$ ।

$r = \frac{m_1 - m_2}{m_2} \times R$

$r = \frac{l_1 - l_2}{l_2} \times R$

अतः $r = \frac{E - V}{V} \times R$

यदि $R = r$ हो तो $i = \frac{E}{2r}$ ।

यदि $R = r$ हो तो $i = \frac{E}{2r}$ ।
 यदि $R \rightarrow \infty$ हो तो $i \rightarrow 0$ ।
 यदि $R = 0$ हो तो $i = \frac{E}{r}$ ।

- ① शुद्ध प्रवाह व प्रकीर्णयुक्त प्रवाहों के बीच अंतर स्पष्ट करें।
- (2) शुद्ध प्रवाह का एक ही चक्रवर्तित क्षेत्र में प्रकीर्णयुक्त क्षेत्र में प्रकीर्णयुक्त क्षेत्र में अंतर स्पष्ट करें।
- (3) शुद्ध प्रवाह व प्रकीर्णयुक्त क्षेत्रों में अंतर स्पष्ट करें।
- (4) शुद्ध प्रवाह व प्रकीर्णयुक्त क्षेत्रों में अंतर स्पष्ट करें।
- (5) शुद्ध प्रवाह व प्रकीर्णयुक्त क्षेत्रों में अंतर स्पष्ट करें।
- (6) शुद्ध प्रवाह व प्रकीर्णयुक्त क्षेत्रों में अंतर स्पष्ट करें।

Ans: शुद्ध प्रवाह क्षेत्रों में

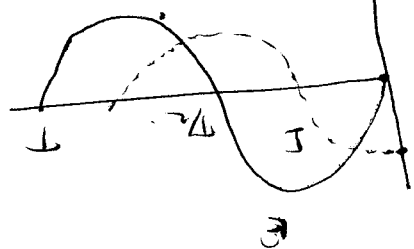
Q: 7 शुद्ध प्रवाह क्षेत्रों में प्रकीर्णयुक्त क्षेत्रों में अंतर स्पष्ट करें।

Ans: शुद्ध प्रवाह क्षेत्रों में प्रकीर्णयुक्त क्षेत्रों में अंतर स्पष्ट करें।

Q: 6 शुद्ध प्रवाह क्षेत्रों में प्रकीर्णयुक्त क्षेत्रों में अंतर स्पष्ट करें।

Ans: $mv = W + \frac{1}{2}mv^2$

Q: 5 शुद्ध प्रवाह क्षेत्रों में प्रकीर्णयुक्त क्षेत्रों में अंतर स्पष्ट करें।



$X_C = \frac{1}{\omega C} = \text{संक्रांतीय प्रतिरोध}$

$I_0 = E_0 \omega C = E_0 / \omega C = \frac{E_0}{X_C}$

$I = E_0 \omega C \sin(\omega t + \pi/2)$

$I = \frac{d}{dt} (C E_0 \sin \omega t) = C \omega E_0 \cos \omega t$

समय t पर संक्रांतीय प्रतिरोध $I = \frac{dQ}{dt}$

$E = E_0 \sin \omega t$



$q = CE = C E_0 \sin \omega t$

Model Answers

3rd Class Test (2017 - 18) Applied Chemistry (103) Duration: 1 hour Max. Marks: 15

1 (a) प्राकृतिक रबर के गुणों में वांछित परिवर्तन करने के लिए उसे सल्फर के साथ गर्म करने की प्रक्रिया को वल्कनिकरण कहते हैं। इससे रबर कम विपदिता अधिक मजबूत एवं लम्बे हो जाता है।

(b)

S.No.	ताप सूचक	ताप रूढ़
1	यह अपेक्षाकृत नर्म होते हैं।	यह अपेक्षाकृत कठोर होते हैं।
2	ये गर्म करने पर और अधिक सूक्ष्म हो जाते हैं।	ये गर्म करने पर भंगुर हो जाते हैं।
3	ये गर्म कर बार बार सांचों में ढाले जा सकते हैं।	ये गर्म कर बार बार सांचों में नहीं ढाले जा सकते हैं।
4	इनमें प्रायः निर्यक बंध नहीं होते हैं।	इनमें प्रायः निर्यक बंध होते हैं।

2 (a) (i) इनका रूथानता गुणों का कम होना चाहिए।

(ii) इनका प्रवाहांक पर्याप्त निम्न होना चाहिए।

(iii) अन्वीय मान निम्न होना चाहिए।

(iv) ये अपेक्षाकृत विकले एवं आसानी से उपलब्ध होना चाहिए।

(b) अपघर्षक कठोर वर्तुओं और उनकी सतह को काटने एवं घिसने के काम में लिए जाते हैं। हीरा एक अच्छा

प्राकृतिक अपघर्षक है।

3 (a)

S.No.	साबुन	अपघर्षक
1	ये उच्च वसीय अम्लों के सोडियम एवं पोटेशियम लवण होते हैं।	ये सल्फोनिक अम्लों के सोडियम एवं पोटेशियम लवण होते हैं।
2	ये कठोर जल में झागा उत्पन्न नहीं करते हैं।	ये कठोर जल में झागा उत्पन्न करते हैं।
3	ये कम ताप पर कम प्रभावी हैं।	ये कम ताप पर भी प्रभावी हैं।
4	ये जैव अपघटनीय हैं।	ये जैव अपघटनीय नहीं हैं।

(b) धातुओं का वायुमंडलीय नमी की उपस्थिति में गीसों से क्रिया कर अवांछित यौगिक बनाने की प्रक्रिया को संक्षारण कहते हैं।

(c) लोहे की सतह पर जस्ते की परत घडाने की क्रिया को वेल्डनिकरण कहा जाता है। इससे लोहे को जंग

नगाने से बचाया जा सकता है।

(a) (i) क्षार धातुओं के साथ अतिवाक्यक पदार्थों के निर्माण में ।

(ii) माइक्रोइलेक्ट्रॉनिक के क्षेत्र में ।

(iii) नैनोतकनीक के विकास में ।

(iv) चिकित्सा के क्षेत्र में औषधिवाहक तंत्र (Drug delivery) ।

(b) सिद्धांत: यह प्रकाश के पूर्ण आंतरिक परावर्तन की घटना पर आधारित है ।

संरचना: एक प्रकाशिक तंतु में तीन समाक्षी क्षेत्र होते हैं । सबसे भीतरी क्षेत्र में प्रकाश का संचरण होता है ।

इसे कोर कहते हैं । मध्य क्षेत्र जिसका अपवर्तनांक भीतरी क्षेत्र की तुलना में कम होता है, कोर की

तुलना में विरल होता है । इसे क्लैडिंग कहते हैं । क्लैडिंग के ऊपर सुरक्षा के लिए एक आवरण होता

है । यह बाह्यतम क्षेत्र होता है । कोर और क्लैडिंग के अक्ष पर एक स्टील तथा तांबे के 6 तार होते

हैं जो इसे मजबूती प्रदान करते हैं ।

कार्यप्रणाली: जब प्रकाश कोर में प्रविष्ट होता है तो क्लैडिंग का अपवर्तनांक तुलनात्मक रूप से कम होने के

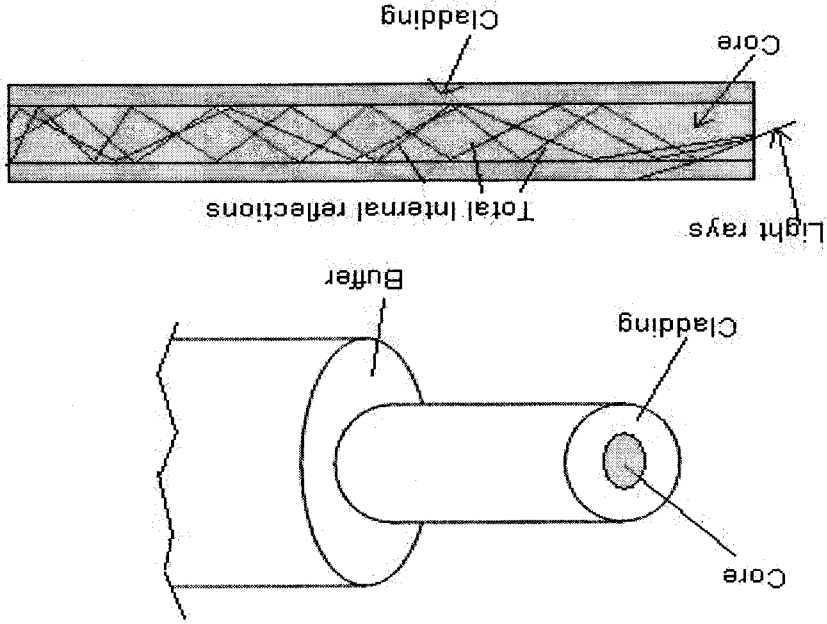
कारण यह आन्तरिक दीवारों पर क्रांतिक कोण से अधिक आपतन कोण पर आपतित होता है

जिससे पूर्ण आंतरिक परावर्तन द्वारा बिना प्रकाशिक तीव्रता में कमी के एक सिरे से दूसरे सिरे

तक संचरित होता है चाहे उड़(केबल) कितनी ही वक्राकार या लम्बी बर्याँ न हो ।

उपयोग: (i) चिकित्सा के क्षेत्र में एंडोस्कोपी ।

(ii) संचार के क्षेत्र में बिना सिग्नल हानि के लम्बी दूरियाँ तक संचरण (ट्रांसमिशन) ।



चित्र: प्रकाशिक तंतु की संरचना एवं कार्यप्रणाली

Q.1. $\frac{e^x - e^{-x}}{e^x + e^{-x}}$ (4 marks)

Solution:

$$y = \frac{e^x - e^{-x}}{e^x + e^{-x}}$$

$$\Rightarrow \frac{dy}{dx} = \frac{(e^x - e^{-x}) \frac{d}{dx}(e^x + e^{-x}) - (e^x + e^{-x}) \frac{d}{dx}(e^x - e^{-x})}{(e^x + e^{-x})^2}$$

$$= \frac{(e^x - e^{-x})(e^x + e^{-x}) - (e^x + e^{-x})(e^x - e^{-x})}{(e^x + e^{-x})^2}$$

$$= \frac{(e^{2x} - e^{-2x}) - (e^{2x} - e^{-2x})}{(e^x + e^{-x})^2}$$

$$\Rightarrow \frac{e^{2x} + e^{-2x} - 2e^{-2x} - (e^{2x} + e^{-2x} - 2e^{2x})}{(e^x + e^{-x})^2}$$

$$\Rightarrow \frac{e^{2x} + e^{-2x} - 2e^{-2x} - e^{2x} - e^{-2x} + 2e^{2x}}{(e^x + e^{-x})^2}$$

[since $e^0 = 1$]

Q.2.

$\frac{e^{\tan x}}{\sin x}$ (5 marks)

Solution:

$$y = e^{\tan x} \Rightarrow \frac{dy}{dx} = e^{\tan x} \cdot \sec^2 x$$

$$h(x) = \sin x \Rightarrow \frac{dh}{dx} = \cos x$$

Step 1: $g(x) = \frac{1}{\sin x}$

$$\frac{dg}{dx} = \frac{d}{dx}(\frac{1}{\sin x}) = \frac{-\cos x}{\sin^2 x} = -\frac{\cot x}{\sin x}$$

Q.3. $\frac{1}{\cos^3 x}$ (6 marks)

$$y = \frac{1}{\cos^3 x} = \sec^3 x$$

$$\Rightarrow \frac{dy}{dx} = 0 \Rightarrow 3\sec^2 x \cdot \sec x \cdot \sin x = 0$$

$$\Rightarrow 3\sec^3 x \sin x = 0$$

$$\Rightarrow 3x^2(x-3)(x-1) = 0$$

$$\Rightarrow x = 0, 1, 3$$

Step 2: $x = 0, 1, 3$ critical points

(i) $x=0$ $\frac{d^2y}{dx^2} \Big|_{x=0} = 0$ $\frac{d^3y}{dx^3} \Big|_{x=0} = (60x^2 - 120x + 30) \Big|_{x=0} = 30 \neq 0$ (point of inflection)

(ii) $x=1$ $\frac{d^2y}{dx^2} \Big|_{x=1} = 10(2-6+3) = -10 < 0$

at $x=1$ $\frac{d^2y}{dx^2} < 0$

(iii) $x=3$ $\frac{d^2y}{dx^2} \Big|_{x=3} = 30(18-18+3) = 90 > 0$

at $x=3$ $\frac{d^2y}{dx^2} > 0$

(6 marks)

$\int \frac{x^2}{(x+1)(x-2)} dx$

$\int \frac{x^2}{(x+1)(x-2)} dx = I$

$\frac{x^2}{(x+1)(x-2)} = 1 + \frac{x+2}{(x+1)(x-2)}$

$\int \frac{x^2}{(x+1)(x-2)} dx = \int \left(1 + \frac{x+2}{(x+1)(x-2)} \right) dx$

$\int 1 \cdot dx + \int \frac{x+2}{(x+1)(x-2)} dx = I$

$\frac{x+2}{(x+1)(x-2)} = \frac{A}{x+1} + \frac{B}{x-2}$

$1 = A(x-2) + B(x+1)$
 $1 = A(-3) \Rightarrow A = -1/3$
 $4 = B(3) \Rightarrow B = 4/3$

$\int \left(-\frac{1}{3} \frac{1}{x+1} + \frac{4}{3} \frac{1}{x-2} \right) dx$

$I = -\frac{1}{3} \log|x+1| + \frac{4}{3} \log|x-2| + C$

$$\Rightarrow I = \int \left(\frac{1}{1/3} + \frac{1+x}{1/3} \right) dx = \int \left(3 + \frac{1+x}{1/3} \right) dx = \int \left(3 + 3(1+x) \right) dx = \int (3 + 3 + 3x) dx = \int (6 + 3x) dx = 6x + \frac{3}{2}x^2 + C$$

$$x=2 \Rightarrow \frac{1}{3} = \frac{1}{3} \Rightarrow A = -1/3$$

$$\frac{x+2}{(x+1)(x-2)} = \frac{A}{x+1} + \frac{B}{x-2} \Rightarrow \frac{x+2}{(x+1)(x-2)} = \frac{A(x-2) + B(x+1)}{(x+1)(x-2)}$$

$$x+2 = A(x-2) + B(x+1) \Rightarrow x+2 = Ax - 2A + Bx + B = (A+B)x + (B-2A)$$

$$\Rightarrow \int \frac{x+2}{(x+1)(x-2)} dx = \int \left(1 + \frac{2-x}{(x+1)(x-2)} \right) dx = x + \int \frac{2-x}{(x+1)(x-2)} dx$$

$$\frac{2-x}{(x+1)(x-2)} = \frac{A}{x+1} + \frac{B}{x-2} \Rightarrow 2-x = A(x-2) + B(x+1)$$

Solving for A and B: $2-x = A(x-2) + B(x+1)$

$$\int \frac{x+2}{(x+1)(x-2)} dx = x + \int \frac{2-x}{(x+1)(x-2)} dx$$

(6 marks)

At $x=3$, $f'(x) > 0$

$$(iii) \quad x=3 \Rightarrow \left(\frac{d^2y}{dx^2} \right)_{x=3} = 30(18-18+3) = 90 > 0$$

At $x=1$, $f'(x) > 0$

$$(ii) \quad x=1 \Rightarrow \left(\frac{d^2y}{dx^2} \right)_{x=1} = 10(2-6+3) = -10 < 0$$

At $x=0$, $f'(x) = 0$ (point of inflection)

$$(i) \quad x=0 \Rightarrow \left(\frac{d^2y}{dx^2} \right)_{x=0} = 60x^2 - 120x + 30 \Big|_{x=0} = 30 \neq 0$$

Q. 2. a) Nos. Word windows of word processor are :-

1) Title Bar :- Title Bar document or file name.

2) Menu Bar :- Menu Bar for various options & it moved. All name of menu bar.

3) Standard Toolbar :- Standard toolbar for various operations.

4) Formatting Toolbar :- Formatting toolbar for various operations.

5) Ruler Bar :- Ruler bar for document measurement.

6) Font Setting Panel :- Font setting panel for various options.

7) End Mark :- End mark (horizontal line) in the document.

8) View document :- View document for various options.

9) Scroll Bar :- Scroll bar for document movement.

10) Status Bar :- Status bar for document information.

11) Auto text :- Auto text for various options.

12) Auto correct :- Auto correct for various options.

13) Auto spell :- Auto spell for various options.

14) Auto grammar :- Auto grammar for various options.

15) Auto format :- Auto format for various options.

16) Auto link :- Auto link for various options.

17) Auto list :- Auto list for various options.

18) Auto indent :- Auto indent for various options.

19) Auto bulleted list :- Auto bulleted list for various options.

20) Auto numbered list :- Auto numbered list for various options.

21) Auto capital letters :- Auto capital letters for various options.

22) Auto hyphenation :- Auto hyphenation for various options.

23) Auto word wrap :- Auto word wrap for various options.

24) Auto page number :- Auto page number for various options.

25) Auto header and footer :- Auto header and footer for various options.

- a) power point custom Animation
- b) slide show.

a) Power point custom animation - गतिमान चित्रण के स्लाइड के लिए प्रारंभिक ऑब्जेक्टों को चयन करने के लिए कस्टम एनिमेशन के लिए फाइल पर क्लिक करें। गतिमान चित्रण के स्लाइड के लिए ऑब्जेक्टों को चयन करने के लिए कस्टम एनिमेशन के लिए फाइल पर क्लिक करें।

steps for custom animation -
 1) slide of slide view में गतिमान चित्रण के स्लाइड को चयन करें।
 2) slide show menu में custom animation पर क्लिक करें।

g) गतिमान चित्रण के स्लाइड को चयन करने के लिए फाइल पर क्लिक करें।
 4) गतिमान चित्रण के स्लाइड को चयन करने के लिए फाइल पर क्लिक करें।
 5) Preview of animation of check करें।
 6) गतिमान चित्रण के स्लाइड को चयन करने के लिए फाइल पर क्लिक करें।

b) slide show :- slide show के लिए फाइल पर क्लिक करें।
 1) गतिमान चित्रण के स्लाइड को चयन करने के लिए फाइल पर क्लिक करें।
 2) keyboard में F5 या slide show menu में view show पर क्लिक करें।

Subject Applied mechanics

Q.1. निम्नलिखित को परिभाषित कीजिए। (प्रत्येक 5)

- (i) Energy (ऊर्जा)
- (ii) Power (शक्ति)
- (iii) Work (कार्य)
- (iv) Mechanical advantage (यांत्रिक लाभ)
- (v) Kinetic energy (गतिज ऊर्जा)
- (vi) Efficiency (दक्षता)

Q.2. एक वस्तु को शीर्ष से नीचे की ओर छोड़ दिया गया। (प्रत्येक 5)

Q.3. परिभाषित करें शीर्ष शक्ति और शीर्ष कार्य। (प्रत्येक 5)
(शक्ति) = Actual machine, शक्ति = Ideal machine

Q.4. एक वस्तु को 300N शक्ति से शीर्ष से उठाया गया और 300N शक्ति से नीचे छोड़ा गया। (प्रत्येक 5)

Q.5.

(3) $\frac{1}{2}mv^2 = \frac{1}{2}mv_0^2 - \frac{1}{2}mv_1^2$ (11)
 $\frac{1}{2}mv^2 = \frac{1}{2}mv_0^2 - \frac{1}{2}mv_1^2$

$\frac{1}{2}mv^2 = \frac{1}{2}mv_0^2 - \frac{1}{2}mv_1^2$

(1) $\frac{1}{2}mv^2 = \frac{1}{2}mv_0^2 - \frac{1}{2}mv_1^2$ (12)
 $\frac{1}{2}mv^2 = \frac{1}{2}mv_0^2 - \frac{1}{2}mv_1^2$

$KE = \frac{1}{2}mv^2$

(2) $\frac{1}{2}mv^2 = \frac{1}{2}mv_0^2 - \frac{1}{2}mv_1^2$ (13)
 $\frac{1}{2}mv^2 = \frac{1}{2}mv_0^2 - \frac{1}{2}mv_1^2$

(3) $\frac{1}{2}mv^2 = \frac{1}{2}mv_0^2 - \frac{1}{2}mv_1^2$ (14)
 $\frac{1}{2}mv^2 = \frac{1}{2}mv_0^2 - \frac{1}{2}mv_1^2$

"Work" done

$\frac{1}{2}mv^2 = \frac{1}{2}mv_0^2 - \frac{1}{2}mv_1^2$

(1) $\frac{1}{2}mv^2 = \frac{1}{2}mv_0^2 - \frac{1}{2}mv_1^2$ (15)
 $\frac{1}{2}mv^2 = \frac{1}{2}mv_0^2 - \frac{1}{2}mv_1^2$

(2) $\frac{1}{2}mv^2 = \frac{1}{2}mv_0^2 - \frac{1}{2}mv_1^2$ (16)
 $\frac{1}{2}mv^2 = \frac{1}{2}mv_0^2 - \frac{1}{2}mv_1^2$

Work done by force

(3) $\frac{1}{2}mv^2 = \frac{1}{2}mv_0^2 - \frac{1}{2}mv_1^2$ (17)
 $\frac{1}{2}mv^2 = \frac{1}{2}mv_0^2 - \frac{1}{2}mv_1^2$

$$\eta = \frac{MA}{VR} \times 100 = \frac{30}{40} \times 100 = 75\%$$

$$MA = \frac{W}{P} = \frac{3000}{100} = 30$$

$$P = 100N$$

$$W = 3000N$$

$$VR = 40$$

Ans.

प्रश्न :- एक व्यक्ति ने 100 रुपयों में 3000 रुपयों का माल बेचा।
 वह इस माल को 40 रुपयों में खरीदा।
 इस लेन-देन में व्यक्ति का प्रतिशत लाभ क्या है?

<p>प्रश्न (3)</p> <p>एक व्यक्ति ने 100 रुपयों में 3000 रुपयों का माल बेचा। वह इस माल को 40 रुपयों में खरीदा। इस लेन-देन में व्यक्ति का प्रतिशत लाभ क्या है?</p>	<p>2] MA/VR</p>
<p>उत्तर :-</p> <p>75%</p>	<p>3] $\frac{W}{P} \times 100$</p>

उत्तर :- 75%

व्यक्ति का प्रतिशत लाभ = $\frac{3000 - 100}{100} \times 100 = 75\%$

Ans.

$$F = 4500 \text{ N}$$

$$P = 160 \text{ mm}$$

$$Q = 110 \text{ mm}$$

Ans 3 Given

$$y = \frac{875000}{23040} = \frac{5625}{1440}$$

$$y = \frac{384EI}{5625}$$

$$y = \frac{1440}{350} = 0.2430 \text{ Radian}$$

$$y = \frac{294EI}{1923} \Rightarrow \frac{294EI}{1923} = \frac{2.8 \times (5000)}{24 \times 6 \times 10^{10}}$$

$$EI = 6 \times 10^{10} \text{ N/mm}$$

$$I = 5 \text{ m} = 5000 \text{ mm}$$

Ans 2 Given

$$M = 32 \text{ kg/m}$$

$$M = \frac{wl^2}{8} \Rightarrow 640000 = \frac{w \times (40)^2}{8}$$

But on beam odd acting

$$\frac{M}{F} = \frac{I}{y} \Rightarrow \frac{M}{8000} = \frac{I}{1200} \Rightarrow M = 640000 \text{ kg/cm}$$

$$y = d/2 = 30/2 = 15 \text{ cm}$$

$$f_{\text{max}} = 1200 \text{ kg/cm}^2$$

$$I = 4 \text{ m} = 400 \text{ cm}^4$$

$$I = 8000 \text{ cm}^4$$

Ans 1 Given

$$D = 30 \text{ cm}$$

$$q = F \times \frac{I \cdot b}{A^2}$$

$$A = 110 \times 55 = 6050 \text{ mm}^2$$

$$\bar{y} = 28 + \frac{55}{2} = 55.5 \text{ mm}$$

$$I = \frac{bd^3}{12} = \frac{110 \times (60)^3}{12} = 3,75,46,667 \text{ mm}^4$$

$$q = \frac{4500 \times 6050 \times 55.5}{3,754,667 \times 110}$$

$$= 0.865 \text{ N/mm}^2$$