Q.22 Find the area bounded by the curve $f(x) = 4 - x^2$ from $x = -2$ to $x = 2$.

SECTION-D

Note: Long answer type questions. Attempt any two questions out of three questions. (2x8=16)

Q.23 a) Explain principle of heat engine.

b) Define reverberation time and how will you control reverberation time ?

Q.24 Prove the $\cos 20^\circ \cos 30^\circ \cos 40^\circ \cos 80^\circ = \sqrt{3}/16$

Q.25 Solve $\int e^x \sin x \, dx$

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1st Year / Architecture Engg.

Subject : Applied Science and Mathematics

Time : 3 Hrs. M.M. : 60

SECTION-A

Note: Multiple choice questions. All questions are compulsory (6x1=6)

Q.1 The S.I. Unit of heat capacity is :

a) J/Kg/K b) J/K

c) Joule d) None of these

Q.2 The light wave is an example of :

a) Transverse Wave b) Longitudinal Wave

c) Both d) None of these

Q.3 The entropy is an isolated system always increases is a statement of :

a) First law of thermodynamics

b) Second law of thermodynamics

c) Third law of thermodynamics

d) Zeroth law of thermodynamics

Q.4 The value of tan 60^{o} is :

a) Ö3 b) 1/Ö3

c) 1 d) 0

Q.5 ò cosx dx =

a) -sinx b) sinx

c) secx d) None of the above

Q.6 Derivative of e^{x} with respect to x is

a) e^{-x} b) e^{x}

c) 1 d) 0

SECTION-B

Note: Objective/ Completion type questions. All questions are compulsory. (6x1=6)

Q.7 Define thermal stress.

Q.8 Define green house effect.

Q.9 The formula for cos (A+B) is_____

Q.10 Evaluate d/dx (x logx).

Q.11 Find the derivative of $\sin^{2} x$ with respect to x.

Q.12 ò $\sec^{2}x\, dx$ = _____

SECTION-C

Note: Short answer type questions. Attempt any eight questions out of ten questions. (8x4=32)

Q.13 Explain first law of thermodynamics.

Q.14 Explain solar energy & colour mixing.

Q.15 Define. Illumination, light flux, zeroth law of thermodynamics & acoustics of building.

Q.16 Explain the principle of refrigeration.

Q.17 Explain cohesive and adhesive forces with examples.

Q.18 Differentiate $y = e^{x} \cos x$ with respect to x.

Q.19 Prove that $\cos 56^{o} \cos 4^{o} - \sin 56^{o} \sin 4^{o} = 1/2$.

Q.20 An electric pole is 10 m high. A steel wire tied to top of the pole is affixed at a point on the ground to keep an angle of 45^{o} with the horizontal through the foot of the pole, find the length of the wire.

Q.21 Evaluate ò $(x^{2} + 3\sin x + 4)\, dx$.