Q.21 Express the following as product : $\sin 5\theta + \sin 3\theta$

Q.22 Evaluate : $\int (x^3 - 2\cos x + \log x)\, dx$

SECTION-D

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

Q.23 a) Integrate $\int x \sin x \, dx$ by parts

b) Find the area under the curve $y = x^2+1$, when $1 \leq x \leq 2$

Q.24 State and explain laws of thermodynamics.

Q.25 a) Explain principle of heat engine

b) Explain colour mixing.

No. of Printed Pages : 4 180212
Roll No. .....

1st Year / Arch. Engg.

Subject:- Applied science and Mathematics

Time : 3Hrs. M.M. : 60

SECTION-A

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

Q.1 The unit of illumination is:

a) Candela b) Lux

c) Lumen d) Flux

Q.2 The amount of heat required to change the heat content of exactly 1 gram of a material by exactly 1°C is called _____

a) Specific heat b) Heat capacity

c) Thermal stress d) None of these

Q.3 The greenhouse is due to:

a) Burning of fossil fuels

b) Deforestation

c) Farming

d) All of these

Q.4 $\frac{d}{dx}(\cot x) =$ _____

a) $\sec^2 x$ b) $-\operatorname{cosec}^2 x$

c) $\cot x$ d) None of these

Q.5 $\cos(90° - x) =$ _____

a) $\sin x$ b) $\cos x$

c) $-\cot x$ d) None of these

Q.6 $\int \sin x \, dx =$ _____

a) $\cos x + c$ b) $\sin x + c$

c) $-\cos x + c$ d) None of these

SECTION-B

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

Q.7 Define solar energy.

Q.8 Define acoustics of buildings.

Q.9 Give the S.I. unit of heat capacity.

Q.10 Different $y = x^2$ w.r.t. x.

Q.11 Integrate $\frac{1}{x^3}$ w.r.t. x.

Q.12 Write down the value of tan 60°.

SECTION-C

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

Q.13 Define Reverberation time. How will you control reverberation time?

Q.14 Define: cohesive force, thermal stress, radiant flux & adhesive force.

Q.15 Explain solar cell and also give its some applications.

Q.16 Give any two methods to control humidity.

Q.17 Write a short note on electrical nature of matter.

Q.18 Evaluate $\lim_{x \to 1} \frac{x^{10} + x^3 + 2}{x + 1}$

Q.19 Differentiate $y = xe^x$ w.r.t x.

Q.20 Evaluate $\sin 105°$.