Seat No.	

SZ-02

Total No. of Pages : 02

F.Y.B.Tech. (CBCS) Examination, Oct.-2025
ENGINEERING PHYSICS
(All Branches)
Sub. Code: 71811

Day and Date : Monday, 19-01-2026 **Total Marks : 70**
Time : 10.30 p.m. to 1.00 p.m.

Instructions :
1) Attempt any three questions from each Section.
2) Figures to the right indicate full marks,

Physical constants: -
i) Avogadro's Number, $N=6.023\times10^{26}$/ kg.atom **ii) Mass of electron= 9.1×10^{-31} kg**
iii) Charge of electron=1.6×10^{-19} C **iv) Speed of light, $c=3\times10^{8}$m/s**
v) Plank's constant, $h=6.63\times10^{-34}$ J.s

SECTION- I

Q.1) Answer the following questions.

a) Define resolving power of grating and obtain an expression for R.P. of grating. **(06)**

b) Explain the phenomenon of double refraction and distinguish between positive and negative crystals **(06)**

Q.2) Answer the following questions.

a) Explain construction and working of ruby LASER. **(06)**

b) Explain the following terms in brief **(05)**

1) Spontaneous emission 2) Stimulated emission

Q.3) Answer the following questions.

a) Explain any six basic requirements of acoustically good hall. **(06)**

b) Find out reverberation time of empty hall of volume 1700 m^3 with following data **(05)**

Surface	Area in m^2	Coefficient of absorption in O.W.U.
Plastered wall	98	0.03
Plastered ceiling	144	0.04
Wooden door	15	0.06
Cushioned chairs	88	1

Q.4) Answer any two from the following questions.

a) 1) What is the highest order spectrum which may be seen with monochromatic light of wavelength 5000 A^0 by means of diffraction grating with 5000 lines per cm. **(03)**

2) A 20 cm long tube containing sugar solution rotates the plane of polarisation by 11^0. If the specific rotation of sugar is 66^0, determine the strength of the solution. **(03)**

b) What are the advantages of fibre optic communication? **(06)**

c) Explain various factors affecting acoustics of hall with their remedy. **(06)**

SECTION- II

Q.5) Answer the following questions.

a) Explain axis of symmetry and centre of symmetry in a cubic crystal system. **(06)**

b) 1) Calculate the interplanar spacing for (111) planes in simple cubic lattice, where lattice constant is 4.2 A^0. **(03)**

2) Draw (110), (100), (211) planes of a cubic crystal system **(03)**

Q.6) Answer the following questions.

a) With neat diagram explain construction and working of scanning tunnelling Microscope. **(06)**

b) What is bottom-up approach for production of nano material? Explain colloidal method of production of nano material. **(05)**

Q.7) Answer the following questions.

a) State Compton effect. With suitable diagram explain experimental arrangement used to study Compton effect. **(06)**

b) The X-ray photon is Compton scattered by an electron through an angle of 90^0.Find the energy (in Kev) of the scattered X-ray photon for the incident photon of energy of 10 Kev. And hence find the energy of recoiled electron in Kev. **(05)**

Q.8) Answer any two from the following questions.

a) Define Packing density and find its values for SC, BCC, & FCC Structure. **(06)**

b) Why properties of material changes at nano level? State and explain different properties of nano-material. **(06)**

c) State and explain Heisenberg's uncertainty principle for position and momentum. **(06)**

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