GOVERNMENT OF INDIA
MINISTRY OF RAILWAYS
(RAILWAY BOARD)
*****

RBE NO.: 15 /2017

No.E(GP) 2016/2/25 New Delhi, dt: 27.02.2017

The General Managers,
All Indian Railways and Production Units.

Sub: Syllabus for professional paper for Selection from Group 'C' to Group 'B' posts in EDP Centres/IT Department of Railways/ Production Units

Ref: Railway Board's letter No. E(GP) 2003/2/41 dated 20.05.2004.

A revised syllabus for professional paper for Selection for promotion from Group 'C' to Group 'B' posts in EDP Centres/IT Department of Railways/Production Units is enclosed for guidance. This may be given wide publicity and circulated amongst the eligible candidates.

2. The revised syllabus shall be effective from the date of issue of this letter. However, Selections which have been notified, need not be disturbed.

3. Please acknowledge receipt.

M. Saluja

Encl: As above

(MEENAKSHI SALUJA)
DY.DIRECTOR, ESTT.(GP)III
RAILWAY BOARD

भारत सरकार (GOVERNMENT OF INDIA)
रेल मंत्रालय (MINISTRY OF RAILWAYS)
(रेलवे बोर्ड) (RAILWAYS BOARD)
****

आरबीई नं. 15 /2017

सं. ई(जीपी) 2016/2/25 नई दिल्ली, दिनांक 27.02.2017

महाप्रंबधक,
सभी भारतीय रेलें और उत्पादन इकाइयां.

विषय: रेलवे/उत्पादन इकाइयों के ईडीपी केन्द्रों/आईटी विभागों में ग्रुप 'सी' से ग्रुप 'बी' पदों में चयन हेतु व्यावसायिक पेपर के लिए पाठ्यक्रम

संदर्भ:- रेलवे बोई का दिनांक 20.05.2004 का पत्र सं. ई(जीपी)2003/2/41.

रेलवे/उत्पादन इकाइयों के ईडीपी केन्द्रों/आईटी विभागों में ग्रुप 'सी' से ग्रुप 'बी' में पदोन्नति के लिए चयन हेतु व्यावसायिक पेपर के लिए संशोधित पाठ्यक्रम मार्गदर्शन के लिए सलंग्न है। इसका व्यापक प्रचार किया जाए और इसे पात्र उम्मीदवारों में परिपत्रित किया जाए।

2. संशोधित पाठ्यक्रम इस पत्र के जारी होने की तारीख से प्रभावी होगा। बहरहाल, वे चयन जो पहले अधिसूचित किए जा चुके हैं, को रोकने की आवश्यकता नहीं है।

3. कृपया पावती दें।

संलग्नक: यथोक्त

मीनाक्षी

(मीनाक्षी सलूजा)
उप निदेशक, स्थापना (जीपी)।।।
रेलवे बोर्ड

GP)2016/2/25 New Delhi, dt: 27.02.2017

...y for information and necessary action to

(1) The Director General & ex-officio General Manager, R.D.S.O., Lucknow.

(2) The CAO, DMW, Patiala

(3) The CAO, MTP (Rlys.), Mumbai and Chennai

(4) The Chairman, Railway Recruitment Board:

Allahabad/Ahmedabad/Ajmer/Bangalore/Bhopal/Bhubaneshwar/Kolkata/

Chandigarh/Chennai/Gorakhpur/Guwahati/Jammu&Srinagar/Malda/Mumbai/

Muzaffarpur/Patna/Ranchi/Secunderabad/Trivendrum.

(5) The Director, NAIR, Vadodara.

(6) The Director, IRISET/Secunderabad, IRIMEE/Jamalpur, IRIEEN/Nasik,IRICEN/

Pune, CAMTECH/Gwalior.

(7) The Railway Liaison Officer, Jeevan Tara Building, Parliament Street, NewDelhi.

(8) The General Secretary, IRCA, New Delhi.

(9) The C.A.O, COFMOW, Rly. Offices Complex, Tilak Bridge, New Delhi-110002.

(10) The Secretary, Railway Rates Tribunal (Chennai), 50 M. C. Nicholas Road, Chetput, Chennai.

(11) The Exec.Director, CRIS, Safdarjung Rly.Stn.Building, Chanakyapuri, New Delhi.

(12) The Director (Movement), Railways, 17 N. S. Road, Kolkata.

(13) The Joint Director (Iron & Steel), 3 Koilaghat Street, Kolkata.

M. Saluja

(MEENAKSHI SALUJA)
DY.DIRECTOR E(GP)III
RAILWAY BOARD.

No.E(GP)2016/2/25 **New Delhi, dt: 27.02.20**

Copy forwarded to:

1. The General Secretary, All Indian Railwaymen Federation, Room No. 253, Rail Bhavan, New Delhi (35 copies)
2. The General Secretary, National, Federation of Indian Railwaymen, Room No. 256-E, Rail Bhavan, New Delhi (35 copies)
3. All Members, Departmental Council and National Council and Secretary, Staff Side, National Council, 13-C, Ferozshah Road, New Delhi (90 spares)
4. The Secretary General, Federation of Railway Officers Association, Room No. 256-A, Rail Bhavan, New Delhi (5 spares)
5. The Secretary General, Indian Railway Promotee Officers Association, Room No. 268, Rail Bhavan, New Delhi (35 spares)
6. The General Secretary, All India RPF Association, Room No. 549, Rail Bhavan, New Delhi-110001.
7. Railway Board Secretariat Staff Association.

For Secretary/Railway Board

Copy to:

PSs to MR, MOS(S), MOS(G),

Sr.PPSs to CRB, FC, MS, MRS, MT, MTR, ME

PPSs to Secretary, DG/RHS, DG/RPF, DG(Personnel),DG(S&T), DG/RS

PPSs to all Addl. Members.

Dy. C&AG(Railways), Room No. 222, Rail Bhawan.

PSs to Adv.(Vig.), , EDE, EDA, EDE(N), EDE(Res), JS, JS(E), JS(G), ED(E&R), EDE(GC), EDV(E), ED(Signal), EDV(S), EDF(E), Adviser(T&MPP), EDE(RRB), EDPC-I, DV(P), DE(L), DE(Res), DE(G), D(IH), JD(MPP), JDE(R)I&II, JDE(Rep)I&II, JDE(D&A), JDE(P&A), DPCI&II, JDE(L), JDE(N), JDE(N)II, DDF(E)I, DDF(E)VI, DDV(A&P), E(NG)I, E(O)III, DDRS(G), DDE(LR)I, Sec(E), PC-III, IV & V, E&R, E(Trg.), E(MPP), V(SS), E(SCT)I &II

Syllabus for Selection from Group 'C' to Group 'B' posts in EDP Centres/IT Department of Railways/Production Units

Establishment Rules & Financial Rules	**50 Marks**
Professional Subject:	**100 Marks**

The Candidates are expected to supplement their experience by a few hours of study on each topic and in this regard certain websites for reference purpose have also been indicated.

Professional Subject:

1. Basics of computing and information Processing

1.1 Business Data Processing

1.1.1. Basic features of off-line systems, transaction processing systems, management information systems, decision support systems. Graphical user interfaces and presentation of information.

1.1.2. Full familiarity with word processor, spreadsheet package, presentation package, email Client and web-browser. Basics of data storage in a database management system.

1.2 Computer organisation and Data structures

1.2.1. Fundamentals of digital logic circuits, binary number system, registers and counters, microprocessor architecture, memory and input/output devices, basics of assembly language.

1.2.2. Data types, stacks, queues, linked lists and other basic data structures, searching and sorting algorithms, and basic idea of complexity.

1.2.3. Basic features of PCs and servers, printers, backup devices.

2. Operating system, DBMS and networking concepts (candidates are expected to specialize in any one area out of Operating Systems, DBMS, or Networking, with a basic idea of all three areas)

2.1. **Basics of operating systems** (proficiency in one Unix flavour or one Windows Server version is expected)

2.1.1. The file system, process management, memory management, syste. administration concepts, networking tools in operating systems, OS leve backup and archival, retrieval and disaster management.

2.1.2. Unix flavours, the vi editor, shell programming, basics or grep and awk, user management, security features in Unix, Linux.

2.1.3. The Windows operating system, including basics of Windows server; file management, FAT, FAT32 and NTFS, user management, the active directory, the Windows registry.

2.2. Basics of DBMSs

2.2.1. The relational model, ER model, database normalization concepts.

2.2.2. Basics of SQL, simple queries, joins, nested queries, grouping, query parsing, indexing concepts.

2.2.3. Database administration, tuning concepts, locking and concurrency control, transaction roll-back and roll forward, database backup and archival.

2.2.4. Proficiency in any one DBMS out of Oracle, Sybase, SQL Server, covering the concepts given above.

2.3 Networking and data communication concepts

2.3.1. Basics of data communication, transmission media, network topologies, the OSI seven layer model, TCP/IP concepts.

2.3.2. LANs and LAN devices, concepts of IEEE 802.3, IEEE802.11b, LAN media, switching, basics of LAN design.

2.3.3. WANs and WAN devices, concepts of routing, switched and packet networks, signal multiplexing methods, network management.

2.3.4. Basics of network security, the Internet, Internet security, viruses, worms and malicious code, intrusion detection.

3. Software development

3.1. **Basics of systems analysis and design**

3.1.1. Modular application design; methods to elicit user requirements; DFDs, ERDs and process mapping methodologies; screen, report and menu design.

3.1.2. Basic idea of component based design, interface design, directory services, web services, object orientation.

3.2. **Application Development** (Proficiency is expected in any one GUI tool, 3GL, or COBOL, with a basic idea of all three)

3.2.1. Using GUI front-end tools, screen building, connecting to back-end databases, and report-writing (any one of VB, D2K/iDS, Power Builder, or other standard GUI tool).

3.2.2. Application development in a structured 3 GL (C, Java, C++, C#) programme constructs in 3 GLs, data types, memory management working with files, working with databases, using standard libraries; the JVM and CLR.

3.2.3. Application development in COBOL, COBOL data structures, file handling in COBOL, sorting and merging, managing databases using COBOL, reporting and screen development.

3.3. **Software engineering concepts**

3.3.1. Software development cycle, basics of software sizing and estimation, software project management, project risk management (basic idea), system audit and security, disaster management strategies.

3.3.1. Basics of software testing and quality assurance, test plans, block box and white box testing, module and integration testing, verification, validation and inspection.

3.3.2. Basics of software testing and quality assurance, test plans, black box and white box testing, module and integration testing, verification, validation and inspection.

3.3.3. Basics of information security, encryption, digital signatures, PKI.

4. **Other Topics in IT (for persons operating in specialized areas)**

4.1. Basics of CAD/CAM

4.1.1. Graphic devices, 2-D geometry and display algorithms, graphic operations, 3-D rendering, animation, graphic standards.

4.1.2. CAD basic, 2-D drafting, surfacing, 3-D solid modelling (proficiency in using a CAD package):

4.1.3. FEA, part programme generation (proficiency in using FEA and part program generation tools.

4.2. Basics of embedded software

4.2.1. Firmware devices, coding and burning, embedded OS, embedded application software, basics of PLCs, ladder logic, using PLC program development tools, data loggers etc.

5. EDP centres in Indian Railways

5.1. Data Centre basics

5.1.1. Data centre basic design features, secure areas and access control, workspace planning; air-conditioning and humidity control; rack-mounted servers and other devices, structured cabling, clean power supply and earthing, UPS basics.

5.1.2. Data centre operations manual, backup strategies, disaster management, basic housekeeping and filing of records.

5.2. IT applications in Indian Railways (as per areas of working of the candidate)

5.2.1. FMIS, Payroll, Workshop system, Inventory control system, Traffic accounts system: detailed knowledge of processes.

5.2.2. SDT applications: PRIME/AFRES, PMIS, MMIS, PAS, FAS, OSS: knowledge of processes.

5.2.3. PRS, UTS, NTES, FOIS: Basic working.

5.2.4. Locally developed applications: for example STORMS, PURSYS, PINS, EASY, PLANS, FACT in RCF; Stores, finance and workshop applications in RWF, DLW, ICF etc.

5.2.5. Other developments on Railways: MIS applications, IR websites, Internet ticketing, IVRS.

6. ICT Infrastructure

6.1 Server Consolidation and Virtualization.

(searchserverervirtualization.techtarget.com)

6.2 Virtualization Systems: VMWare, RHEV, Citrix, Open Stack etc.

(www.redhat.com)

6.3 Software Defined Data Centre and Networks

(https://en.wikipedia.org)

6.4 Cloud Computing and its standards, certification (www.cio.com)

6.5. Service Oriented Architecture (http://www.service-architecture.com)

7. Mobility

7.1 Mobile Apps Technology Architecture and Programming (http://www.smartbridge.com)

7.2 Mobile Data Management (searchmobilecomputing.techtarget.com)

7.3 Mobile Devices Management (https://www.mobileiron.com)

8. UIDAI

8.1 Knowledge of UIDAI Authentication framework (https://authportal.uidai.gov.in)

8.2 API (https://www.webopedia.com)

9. Data Analytics

9.1 Use of Desktop/Cloud based Data Analytical Tools (https://www.computerworld.com)

10. Performance based logistics

10.1. Parameter definition and determination of SLA's (https://help.sap.com)

10.2. Measurement using Application Performance Measurement tools (www.gallop.net)

11. Knowledge of standards

11.1. ITIL V3 (www.itilcertification.org)

11.2. ISO 20000 (http://www.iso.org)

11.3. ISO 27000 (www.iso.org)

11.4. ISO 15288 (www.15288.com)

11.5. CMMI

(https://en.wikipedia.org)

12. **Cyber Security Laws and Guidelines**

(http://www.cyberlawsindia.net)

12.1. IT Act

(http://www.itlaw.in)

12.2. MHA Guidelines

(http://mha.nic.in/policy-guidelines)

12.3. NCIIPC Guidelines

(http://cis-india.org)

12.4. CERT-IN Guidelines

(http://www.cert-in.org.in)

12.5. Digital India Policies

(http://meity.gov.in)

12.6. Social Media Guidelines

(http://meity.gov.in)

12.7. Password Policy

(https://mail.nic.in)

12.8. Guidelines for India Government Websites (GIGW)

(http://guidelines.gov.in)

13. **Use of Social Media**

13.1. Twitter

(https://twitter.com/twitter)

13.2. Facebook

(www.facebook.com/)

13.3. You Tube

(https://in.youtube.com/)

13.4. Google+ etc.

(http://www.zigzigger.blogspot.in)

14. **Website Development**

14.1. HTML5

(http://www.w3schools.com)

14.2. XML

(http://www.xmlfiles.com/xml/)

14.3. PHP

(www.php.net)

14.4. Open Source Web CMS Systems: Liferay, Drupal, Joomla, Wordpress.

(https://colorlib.com)